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# COMMERCIAL FISHERIES REVIEW

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DEPARTMENT OF THE INTERIOR

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AND SERVICES

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# COMMERCIAL FISHERIES REVIEW

A review of developments and news of the fishery industries  
prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor  
H. M. Bearse, Assistant Editor

Mailed free to members of the fishery and allied industries. Address correspondence and requests to the: Chief, Branch of Market News, Bureau of Commercial Fisheries, U. S. Department of the Interior, Washington 25, D. C.

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# COMMERCIAL FISHERIES REVIEW

February 1958

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## FEDERAL SPECIFICATIONS FOR FISHERY FOOD PRODUCTS AND THE RESPONSIBILITY OF THE U. S. BUREAU OF COMMERCIAL FISHERIES

By Frank T. Piskur\* and Mario N. Sereno\*

### ABSTRACT

THIS ARTICLE IS INTENDED FOR THOSE WHO BID TO SUPPLY FISHERY PRODUCTS TO FEDERAL AGENCIES OR WHO OTHERWISE ARE INTERESTED IN THE SPECIFICATION PROGRAM. IT DISCUSSES HOW FEDERAL SPECIFICATIONS SERVE BOTH INDUSTRY AND GOVERNMENT, THE PART THE U. S. BUREAU OF COMMERCIAL FISHERIES PLAYS IN THE DEVELOPMENT OF FEDERAL SPECIFICATIONS FOR FISHERY FOOD PRODUCTS, WHAT A FEDERAL SPECIFICATION IS, WHAT ONE LOOKS LIKE, HOW A SPECIFICATION IS DEVELOPED, AND WHAT THE BUREAU'S SPECIFICATION PROGRAM IS FOR FISCAL YEAR 1958.

### BACKGROUND

Federal specifications serve both industry and government in the following ways:

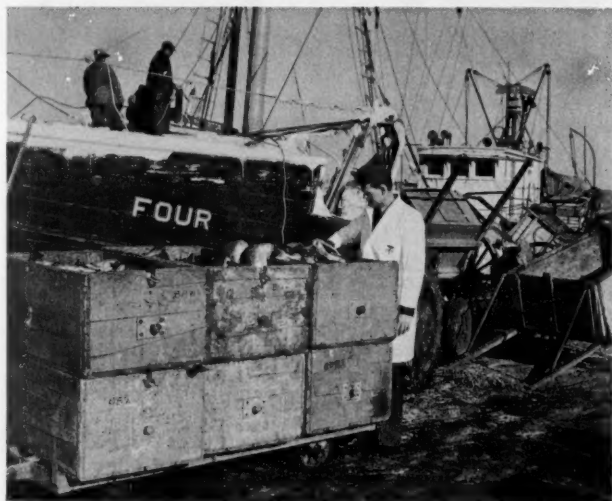


FIG. 1 - U. S. VETERINARY CORPS INSPECTOR CHECKING QUALITY OF FISH WHEN LANDED FROM THE VESSEL. INSPECTION MAY BE MADE BY THE PROCURING AGENCY AT ANY TIME OR PLACE DESIGNATED BY THE PROCURING AGENCY.

1. Standardize the items used by the Federal Government.

2. Reduce the number of sizes, kinds, and types of items.

3. Standardize packing, packaging, and method of preservation.

4. Provide a means by which buyer and seller can reach an agreement.

5. Become legal documents when used as a basis for contracts.

6. Enable bidders to compete on an equal basis.

Accordingly, the specification must give a clear, accurate description of the

item. This type of specification can be obtained only by wholehearted participation of industry in the specification program.

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The U. S. Bureau of Commercial Fisheries is responsible for the research and development needed to prepare Federal specifications for fishery food products. Carrying out this responsibility entails:

1. Determination of the fish product needs of Federal agencies.
2. Evaluation of the products.
3. Conduct of any research needed.
4. Preparation of the specifications in cooperation with the fishing industry and other Federal agencies involved.

Primary responsibility for development of specifications within the Bureau is delegated to the Fishery Technological Laboratory in East Boston, Mass. This work is done in cooperation with the Quartermaster Food and Container Institute for the Armed Forces, Chicago, Ill. The Quartermaster Food and Container Institute is responsible for the packing and packaging sections of Federal Specifications. The purpose of this report is to describe the fishery product specification program.

#### WHAT IS A FEDERAL SPECIFICATION?

A Federal specification is a clear, accurate description of the technical requirements for a material, a product, or a service, including the procedure to determine that the requirements have been met.

Accordingly, fishery product specifications are used in invitation for bids and serve as a basis for contracts in the purchase of fishery products for Federal agencies. The specifications include packing and marking requirements and prescribed methods of inspection and testing to determine if the requirements have been met by the supplier.

#### TYPES OF SPECIFICATIONS FOR FOOD PRODUCTS

Food-product specifications are of three types: (1) Federal, (2) Interim Federal, and (3) Departmental.

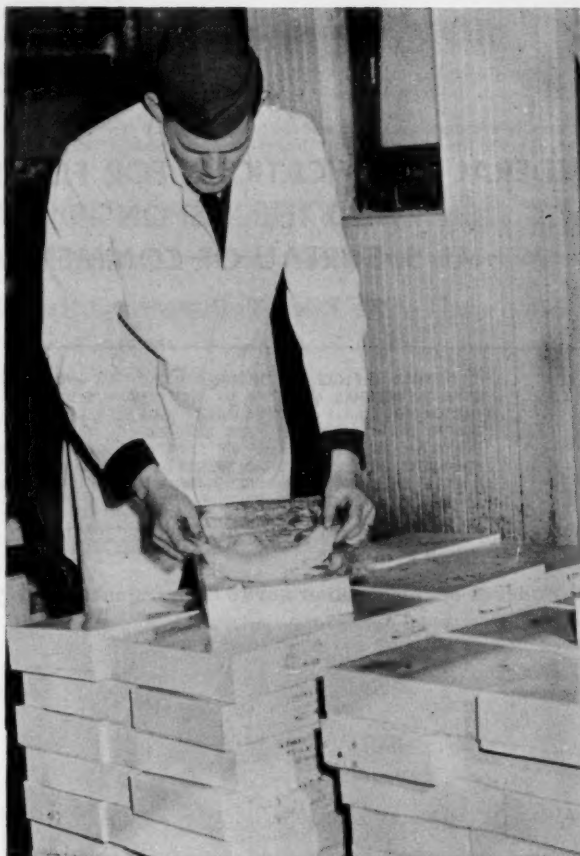


FIG. 2 - U. S. ARMY VETERINARY CORPS INSPECTOR CHECKING PACKAGED FILLETS BEFORE PACKAGES ARE PLACED IN THE QUICK FREEZER.



The Federal specification is prepared to meet the requirements of two or more Governmental agencies. It is issued by the Commissioner, Federal Supply Service, General Services Administration, for use by all Federal agencies.



FIG. 3 - U. S. ARMY VETERINARY CORPS INSPECTOR STAMPING FINAL PACKAGES OF FROZEN FISH FILLETS.

The Interim Federal specification is issued by the same agency and is intended to cover the immediate procurement needs of one agency, but it may be used by other agencies. It is intended for final processing as either a new or a revised Federal specification.

The Departmental specification is developed and prepared by, and is of interest to, a particular Federal agency. One such specification of much interest to fishery industries is the Military specification. This specification is prepared to meet the requirements of the Armed Forces. It is drafted by the Quartermaster Food and Container Institute and published under the direction of the Munitions Board Standards Agency. This specification is primarily used by the Department of Defense but may be used by other agencies. It describes food and ration items that are not covered by a federal specification or items that have been modified to provide military characteristics not covered in the Federal specification requirements.

#### SPECIFICATION FORMAT

Product specifications contain six numbered sections as follows:

**Section 1. Scope and classification.** This section gives the extent to which the specification applies to the product and, if necessary, gives a detailed description.

**Section 2. Applicable specifications and publications.** This section lists all the documents that form a part of the specification.

**Section 3. Requirements.** This section states all essential requirements and descriptions applying to the product and refers, as applicable, to the character or quality of the raw materials, formula, product characteristics, product marking, and workmanship. The section indicates the standard of quality and workmanship that the commodity must meet to be acceptable.

**Section 4. Sampling, inspection, and test procedures.** This section contains detailed information on the methods and frequency of sampling, inspection, and applicable test methods to determine whether the product conforms to the specification requirements.

**Section 5. Preparation for delivery.** This section covers the requirements for the preservation, packaging, packing, and marking of packages and containers.

**Table 1 - List of Fishery Products Specifications and Action Required on Each**

Federal Specification	Specification Number <sup>1/</sup>	Date Specification Became Effective	Action Required on Specification
Clams: Canned	-	-	Proposed Federal Specification.
Clams, Raw, Shucked; Fresh (Chilled) and Frozen	PP-C-401a	April 25, 1952	Amend to include new market products and practices.
Crab Meat: Canned	PP-C-651a	Sept. 25, 1956	Appears adequate.
Crab Meat, Cooked; Chilled and Frozen	PP-C-656a	March 6, 1956	Appears adequate.
Fish: Fresh (Chilled) and Frozen	PP-F-381d	Sept. 3, 1954	Amend to include additional Species.
Lobsters: Live; Chilled and Frozen Meat	-	-	Proposed Federal Specification.
Oysters: Canned	PP-O-951	March 3, 1931	Revise to reflect present-day products and packaging and to include new standards of identity.
Oysters: Raw, Shucked (Fresh and Frozen)	PP-O-956	July 27, 1950	Appears adequate.
Salmon: Canned	PP-S-31b	Aug. 8, 1951	Appears adequate.
Sardines: Canned	PP-S-51d	April 11, 1957	Revise to include re-evaluation of certain counts, reclassification of defects, and possible new types and styles.
Scallops: Fresh (Chilled) and Frozen	-	-	Convert Departmental (Military) to Federal Specification.
Shrimp: Canned	PP-S-311a	Sept. 8, 1955	Appears adequate.
Shrimp, Frozen, Raw; Breaded	PP-S-315	(New)	Convert proposed Departmental (Military) to Fed. Specification.
Shrimp, Raw and Cooked; Chilled and Frozen	PP-S-316a	June 20, 1955	Amend or revise to include possible new methods of packing and re-evaluation of defects classifications.
Tuna Fish: Canned	PP-T-771	March 31, 1931	Revise to reflect present-day products and packaging.

<sup>1/</sup> COPIES OF FEDERAL SPECIFICATIONS AND STANDARDS MAY BE OBTAINED AS OUTLINED UNDER "GENERAL INFORMATION" IN THE INDEX OF FEDERAL SPECIFICATIONS AND STANDARDS AND AT THE PRICES INDICATED IN THE INDEX. THE INDEX, WHICH INCLUDES CUMULATIVE MONTHLY SUPPLEMENTS AS ISSUED, IS FOR SALE ON A SUBSCRIPTION BASIS BY THE SUPERINTENDENT OF DOCUMENTS, U. S. GOVERNMENT PRINTING OFFICE, WASHINGTON 25, D. C.

IF YOU NEED SINGLE COPIES OF SPECIFICATIONS FOR BIDDING OR OTHER PURPOSES, THEY ARE AVAILABLE WITHOUT CHARGE AT THE GENERAL SERVICES ADMINISTRATION REGIONAL OFFICES IN BOSTON, NEW YORK, ATLANTA, CHICAGO, KANSAS CITY, MO.; DALLAS, DENVER, SAN FRANCISCO, LOS ANGELES, SEATTLE, AND WASHINGTON, D. C.

**Section 6. Notes.** This section contains information of a general or explanatory nature.

#### BASIC REQUIREMENTS IN THE DEVELOPMENT OF A SPECIFICATION

The following requirements are observed in the development of a specification:

(1) The needs of all government agencies having an interest in the items must be considered.

(2) The number, types, grades, and varieties shall be held to a minimum consistent with the economy of the operation.

(3) Wherever practical, functional or performance requirements rather than compositional requirements shall be specified.

(4) Nationally-recognized industry commercial specifications and standards shall be used and adopted to the maximum extent practicable.

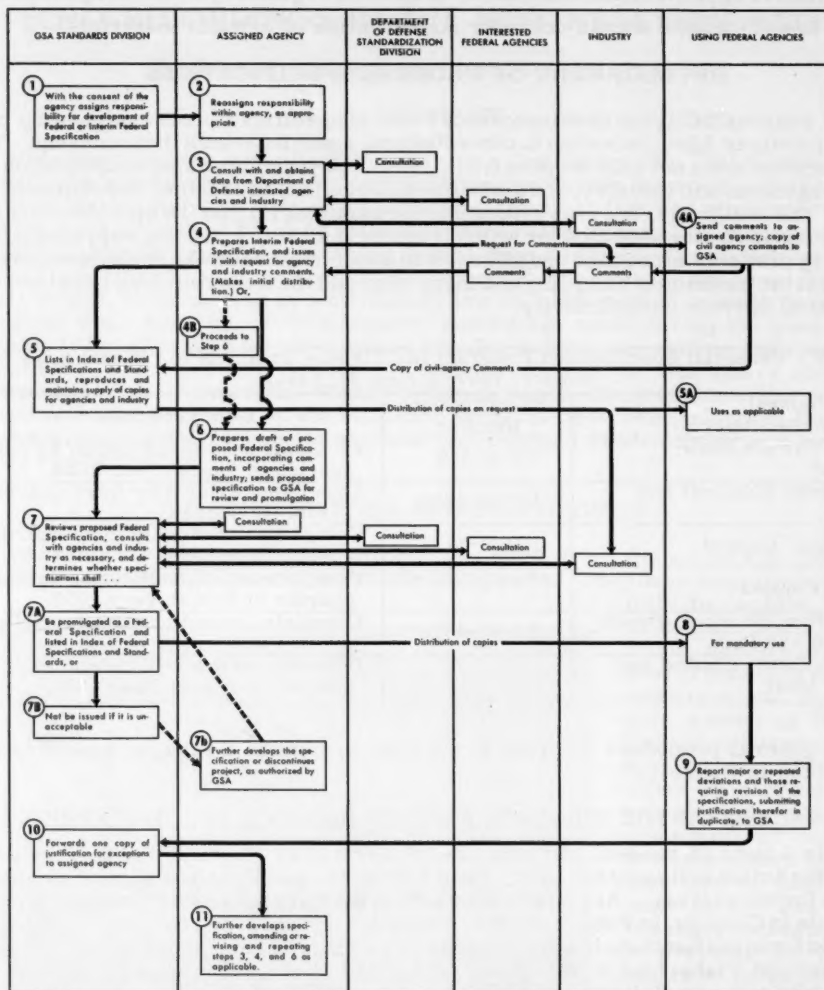


FIG. 1 - FLOW CHART FOR DEVELOPMENT OF FEDERAL AND INTERIM FEDERAL SPECIFICATIONS.

(5) Specification requirements that can be met by products of standard commercial production shall be used to the maximum extent consistent with Government requirements.

(6) The preservation, packaging, packing, and marking requirements shall be uniform to the greatest extent possible consistent with the varying needs of Federal agencies and shall be adequate to assure delivery and storage of products in a satisfactory condition, with the greatest practicable conservation of manpower, materials, and money.

(7) Federal specifications shall be consistent with the regulatory specifications and standards of other Federal agencies.

(8) Federal specifications shall be consistent to the maximum degree possible with the permissive specifications and standards of other regulatory Federal agencies.

(9) Specifications should consider conservation of critical materials.

#### DEVELOPMENT OF FEDERAL SPECIFICATIONS

The responsibility for development of Federal specifications is assigned by the General Services Administration to other Federal agencies --with their consent. The assignment includes not only responsibility for development, but also coordination with Federal agencies and industry, and amendment, revision, and further development as needed. The assigned agency is responsible for assuring (1) that the specification is adequate for use by the agencies for which it will be mandatory, (2) that representatives of industry properly concerned are afforded an opportunity to make recommendations, and (3) that the methods of sampling and inspection and the tests required have been tried and found to operate satisfactorily.

Table 2 - Essential Specification Program for Fishery Products for Fiscal Year 1958 (July 1, 1957 to June 30, 1958)		
Federal Specification	Specification Number	Complete Date
Shrimp, Frozen, Raw: Breaded	PP-S-315	Complete new Specification by second quarter of Fiscal Year 1958.
Fish: Fresh (Chilled) and Frozen	PP-F-381d	Complete revision by third quarter of Fiscal Year 1958.
Tuna Fish: Canned	PP-T-771	Complete revision by third quarter of Fiscal Year 1958.
Clams: Canned	-	Complete new Specification by fourth quarter of Fiscal Year 1958.
Clams, Raw, Shucked: Fresh (Chilled) and Frozen	PP-C-401a	Complete Amendment by second quarter of Fiscal Year 1959.
Lobster: Live; Chilled and Frozen Meat	-	Complete new Specification by second quarter of Fiscal Year 1959.

The general procedure involved in the development of a Federal specification is summarized in figure 1.

#### ANALYSIS OF THE BUREAU'S FISHERY PRODUCT SPECIFICATIONS

Table 1 lists 15 present and proposed Federal specifications for fishery products and the action indicated for each. Only 5 of the 15 specifications appear completely adequate for current use. At a conference held at the Quartermaster Food and Container Institute in Chicago, in February 1957, priorities and proposed completion dates were developed for specifications of high interest. The specification program of the Bureau of Commercial Fisheries for fiscal year 1958 (table 2) was developed to conform with this priority and completion schedule.

#### LITERATURE CITED

##### ANONYMOUS:

1952. FEDERAL SPECIFICATIONS FOR FISHERY PRODUCTS, COMMERCIAL FISHERIES REVIEW, VOL. 14, NO. 5 (MAY), PP. 14-16. (SEP. NO. 314.)
1954. THE DEVELOPMENT OF FEDERAL SPECIFICATIONS, COMMERCIAL FISHERIES REVIEW, VOL. 16, NO. 9 (SEPTEMBER), PP. 24-26.
- REGULATIONS OF THE GENERAL SERVICES ADMINISTRATION, TITLE I, PERSONAL PROPERTY MANAGEMENT, PART 2, SPECIFICATIONS, STANDARDS, AND QUALIFIED PRODUCTS LISTS, GENERAL SERVICES ADMINISTRATION, WASHINGTON, D. C. (THIS DOCUMENT WAS PREPARED ONLY FOR THE GUIDANCE OF ADMINISTRATORS AND ACCORDINGLY IS NOT AVAILABLE FOR PUBLIC DISTRIBUTION.)

1957. SUBSISTENCE SPECIFICATION PROGRAM, QUARTERMASTER FOOD AND CONTAINER INSTITUTE FOR THE ARMED FORCES, RESEARCH AND DEVELOPMENT DIVISION, OFFICE OF THE QUARTERMASTER GENERAL, CHICAGO, ILL. (THIS DOCUMENT WAS PREPARED ONLY FOR THE GUIDANCE OF ADMINISTRATORS AND ACCORDINGLY IS NOT AVAILABLE FOR PUBLIC DISTRIBUTION.)

NOTE: FOR FURTHER INFORMATION REGARDING FEDERAL SPECIFICATIONS FOR FISHERY PRODUCTS, YOU ARE INVITED TO WRITE, TELEPHONE, OR VISIT THE FISHERY TECHNOLOGICAL LABORATORY, BUREAU OF COMMERCIAL FISHERIES, U.S. FISH AND WILDLIFE SERVICE, 61 SUMNER ST., EAST BOSTON 28, MASS. (TELE.: LOGAN 7-6880.)



## CORRELATION OF MIDWATER TRAWL CATCHES WITH ECHO RECORDINGS IN THE NORTHEASTERN PACIFIC

By Edward A. Schaefers\* and Donald E. Powell\*\*

### SUMMARY

Midwater trawling experiments, utilizing a fish finder (the "Sea Scanar") equipped with a prototype recorder, were conducted during the spring of 1956 off the coasts of Washington and British Columbia. Catches of fish and other marine organisms were identified from 66 midwater tows made by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John N. Cobb. Trawl-fishing depths ranged from 10 to 213 fathoms over bottom depths of 15 to 950 fathoms. Catches varied widely, from no fish in a 60-minute tow to 5,500 pounds, mostly hake, in a 20-minute tow. Example of "Sea Scanar" recordings made during the tows show different types of traces for the various species caught, but with no fully consistent pattern. Traces of dense schools of hake are compared with others showing scattered patches of rockfish. Plankton forms, particularly euphausiids, were abundant and caused traces on the recorder which at first were mistaken for fish. With experience a fair degree of success was attained in identifying echoes and predicting species in the catch.

### INTRODUCTION AND BACKGROUND

Midwater trawls capable of fishing at any depth from the surface to the bottom have been developed primarily within the last decade. They have been used success-

fully to capture herring in certain parts of the world, namely in Scandinavian and other European countries and in the inside waters of British Columbia (Barraclough and Johnson 1956). In addition to herring, other pelagic fish such as mackerel and anchovies are commonly caught with this type of gear (Glanville 1956). The Larsen two-boat midwater trawl is probably the best known of those now in use.

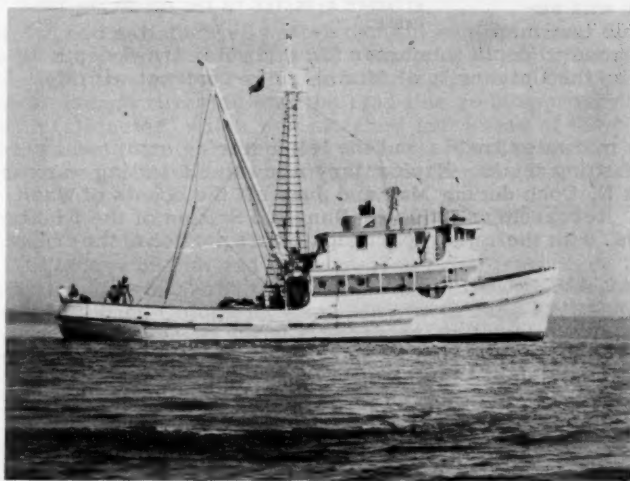


FIG. 1 - THE U. S. BUREAU OF COMMERCIAL FISHERIES EXPLORATORY FISHING VESSEL JOHN N. COBB MIDWATER TRAWLING OFF THE COAST OF WASHINGTON.

Two of the major problems faced by commercial fishermen and research workers using midwater trawls are: (1) locating and identifying schools of fish in mid-

water, and (2) positioning

the net at the proper depth to catch the fish. Experience has shown that few if any

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WASH.

fish are caught by "blind" towing, and for good hauls it is necessary to locate concentrations of known species of fish, determine their depth, and devise some accurate means of net positioning (Richardson 1957).

While midwater trawling thus far has been concerned primarily with the capture of herring, it has been proposed by some fishermen and researchers that other types of fish which spend part of their time off the bottom, such as rockfish and cod, might be available to midwater trawls when they are not available to bottom gear (Alverson and Powell 1955). To investigate this possibility, the Branch of Exploratory Fishing and Gear Research began developing gear and equipment several years ago. Objectives were to develop suitable one-boat midwater trawls and accessory equipment which could be used on the Bureau's exploratory fishing vessels in the northwestern Atlantic, northeastern Pacific, and Gulf of Mexico.

Development and testing of the gear and equipment were undertaken at the gear research station located at Coral Gables, Fla. Underwater television was used for direct observation of midwater trawls in action (Sand 1955, and Sand and McNeely 1956). Inspecting and photographing the gear underwater was accomplished from a controllable two-man diving sled (Sand 1956). An acoustic depth telemeter for midwater trawl depth determination was constructed by the University of Miami under contract with the Bureau.

In the spring of 1956 two midwater trawls and the telemetering equipment were shipped to Seattle for actual fishing trials. Exploratory midwater trawling was carried out aboard the M/V John N. Cobb during May and June off the coasts of Washington and British Columbia. Researchers from the Nanaimo Station of the Fisheries Research Board of Canada, with their gear, participated in a portion of the cruise.

#### GEAR AND EQUIPMENT USED

A "Sea Scanar" equipped with a prototype recorder was the principal instrument used on the John N. Cobb for locating fish in midwater. Although a standard-type recording echo sounder was employed primarily for sounding the deeper bottom contours, it was also useful in confirming the location of the more dense fish schools located with the "Sea Scanar."

The acoustic telemeter for determining constant depth of the trawl gear consisted of (1) a sensing and transmitting unit which was attached to the port cable immediately ahead of the trawl door; (2) a hydrophone trailed on a boom just beneath the surface amidships for picking up the sonic depth signal; and (3) a receiving set on which the operator listened for and determined the signal frequency. Sound frequencies were then converted to corresponding depths using a prepared conversion table. (A complete description of this instrument is given by Stephens and Shea 1956.) Although accurate and quite dependable, the instrument was too large and complicated for practical adaptation to fishing vessels, and it has since been replaced by a simplified electrical depth telemeter (see fig. 2).

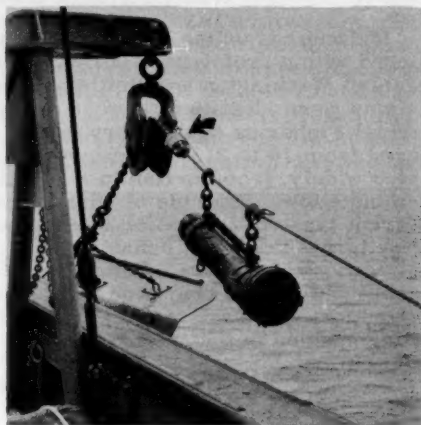


FIG. 2 - THE CUMBERSOME ACOUSTIC DEPTH TELEMETER UNIT, CENTER, HAS BEEN REPLACED BY THE SMALL ELECTRICAL DEVICE, UPPER LEFT, ATTACHED DIRECTLY TO THE END OF THE TRAWL CABLE.

Three midwater trawls were used, all of nylon: the Canadian midwater herring trawl, and 40-foot and 50-foot square-opening trawls made at the Bureau's Coral Gables gear research station. The Canadian trawl had mesh sizes ranging from 5 inches in the wings to  $1\frac{1}{4}$  inches in the cod end. (For a complete description of this net see Barraclough and Johnson 1956.)

The two trawls furnished by the Bureau were similar in design to the Canadian trawl, being made up of four equal sides and small wings on each corner. Mesh sizes

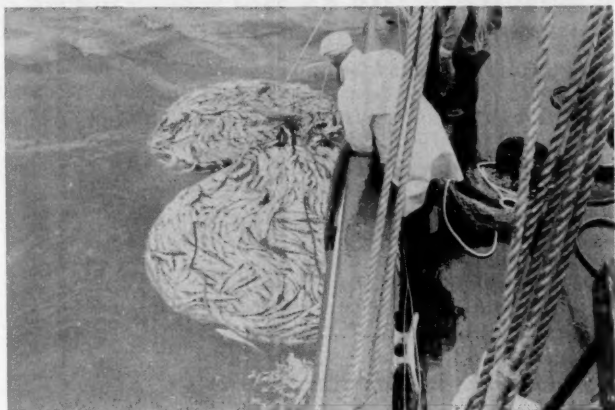


FIG. 3 - MIDWATER TRAWL CATCH, MOSTLY HAKE, ALONGSIDE THE JOHN N. COBB.

were  $4\frac{1}{2}$  inches (stretched measure) in the wings and body, and  $3\frac{1}{2}$  inches in the cod end. Trawl doors, or otter boards, were of plywood, hydrofoil design, 4 x 6 feet, rigged with a conventional bridle arrangement and not fished at the ends of separate pennants as with the Canadian gear. The last nine feet of each cod end was lined with  $1\frac{1}{4}$ -inch cotton mesh to retain some of the small organisms which would normally pass through the larger mesh.

Before going offshore, the midwater gear was tested in inside waters and

performed satisfactorily after certain modification. The hydrofoil doors were found to be extremely sensitive with a tendency to collapse when set in choppy seas, but this fault was partly remedied by adjustment of the chains. Sounding the net from a motor launch revealed that the lead line rode approximately 60 feet deeper than the depth telemeter, which was attached just ahead of the port door (with 40-fathom bridles between the doors and the net). Consequently, a correction factor of 60 feet was added to telemeter readings to determine lead-line depth during all tows.

#### FISHING RESULTS

Catches of fish and other marine organisms were identified from 66 midwater tows made in offshore waters between Grays Harbor, Wash., and Queen Charlotte Sound, British Columbia, from May 19 to June 21, 1956. The trawls were fished at depths ranging from 10 to 213 fathoms over bottom depths varying from 15 to 950 fathoms (Anonymous 1956). Sizable concentrations of fish at mid-depths were difficult to find during most of the cruise.

Fishing results fluctuated widely, from no fish in a 60-minute tow to 5,500 pounds, nearly all hake, in a 20-minute tow (see fig. 3). The wide variation in catches was not unexpected on this initial effort. Although numerous echo traces of fish in the North Sea have been identified (Hodgson 1950), it has been noted that the results do not have worldwide application and that intelligent interpretation of echo traces depends upon knowledge assembled locally (Hodgson and Fridriksson 1955). Except for inshore schooling herring, characteristic fish traces and reactions of fish to midwater trawls were unknown for the area in which the John N. Cobb operated.

In addition to the lack of identifiable echo traces from the area, this was the first attempt to utilize the "Sea Scanar" with a recorder for midwater trawling. Consequently there was no basis for interpretation of echoes received. As a result, many of the early tows made on likely-looking traces caught only plankton, jellyfish, small feed, or a few larger fish.



FIG. 4 - "SEA SCANAR" RECORDER TRACES MADE DURING PRODUCTIVE MIDWATER TONS; MOSTLY HAKE AND ROCKFISH.



It was only after considerable sounding with the "Sea Scanar" and numerous tows with the midwater trawls that reasonably-sound opinions could be formed as to whether traces were caused by commercial-size fish, small feed fish, or by euphausiids or other plankton forms. Even then, sets were made on "doubtful" traces to gain additional knowledge on the organisms present in midwater in this area. Sets on "doubtful" traces usually produced no significant fish catches. The "Sea Scanar" proved to be extremely sensitive to plankton (euphausiids were abundant in most localities over the continental shelf), and it was often necessary to reduce sensitivity on the instrument to eliminate much of the plankton trace so that fish echoes could be distinguished.

There was an indication from the composition of some midwater catches that hake and rockfish may school together or in close proximity. Mixed catches sometimes occur in the North Sea midwater trawl fishery where catches of brisling also contain herring and mackerel (Glanville 1956). This degree of nonselectivity of midwater trawls probably will not create any greater problems in sorting the catch than is normally encountered on bottom trawlers.

#### INTERPRETATION OF "SEA SCANAR" TRACES

Examples of "Sea Scanar" recorder traces made during midwater tows are presented in figures 4, 5, and 6. In all cases the sounding angle was vertical (depth-sounding position) to show what was directly under the ves-

sel. Figs. 4 and 5 contain traces made during tows which caught significant quantities of fish, while those in figure 6 were made on tows which caught none or only a few fish. The entire recordings are presented for the shorter tows, while only representative sections of the longer tows are shown.

LIST OF FISHES	
Yellow-tailed rockfish . . . . .	<u>Sebastodes flavidus</u>
Orange rockfish . . . . .	<u>Sebastodes pinniger</u>
Widow rockfish . . . . .	<u>Sebastodes entomelas</u>
Pacific ocean perch . . . . .	<u>Sebastodes alutus</u>
Hake . . . . .	<u>Merluccius productus</u>
Sablefish . . . . .	<u>Anoplopoma fimbria</u>
Arrow-toothed flounder . . . . .	<u>Atheresthes stomias</u>
Dogfish . . . . .	<u>Squalus suckleyi</u>
Pink shrimp . . . . .	<u>Pandalus jordani</u>

Traces in figure 4A, B, and C are examples of dense schools of hake as proven by the midwater trawl catches. 4A resulted in the best catch in the least amount of fishing time--5,430 pounds of hake and 70 pounds of other species in 20 minutes. The catch rate differed because, as shown by the depth telemeter, the net in 4A was in the most dense part of the hake school at the start and through most of the tow; while in 4B the net was too shallow for the main body of the school near the start and too deep during the middle of the tow. As for 4C, the net was too shallow during most of the tow.

Since the net was known to be in the dense portion of the school in figure 4A, it was hauled soon after it appeared that the main body of fish had been passed, which was not the case in 4B and C. Even though the telemeter provided continuous accurate information on the depth of the trawl, it was not always possible to keep the trawl in the most dense portion of the schools, which varied in depth considerably. Regulation of trawl depth was accomplished by varying the length of towing warp or the speed of the vessel. After each adjustment a short period of time was required for the trawl to stabilize at the desired depth; but by then the position of the school may have changed, requiring further adjustment to raise or lower the trawl to the correct indicated depth for best results.

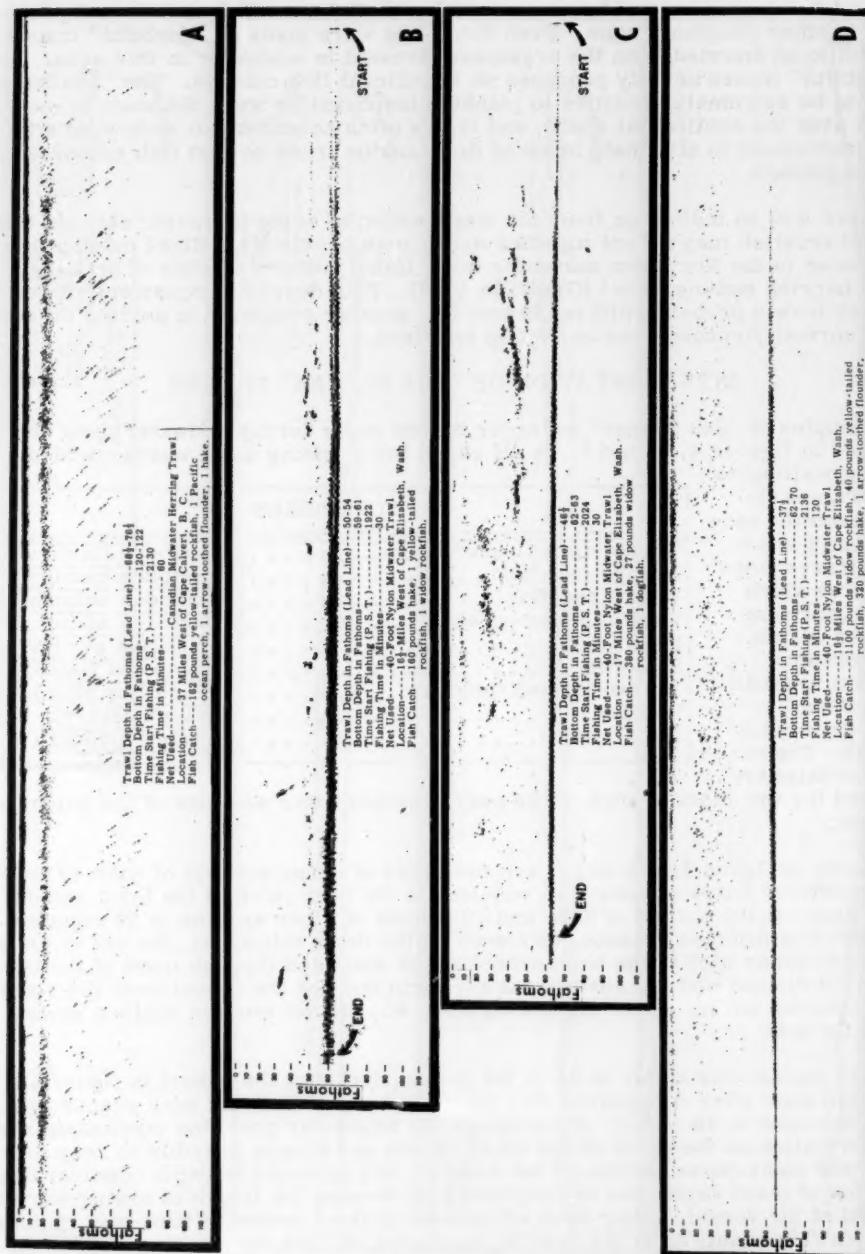


FIG. 5 - "SEA SCANAR" RECORDER TRACES MADE DURING PRODUCTIVE MIDWATER TOWS, MOSTLY HAKE AND ROCKFISH.

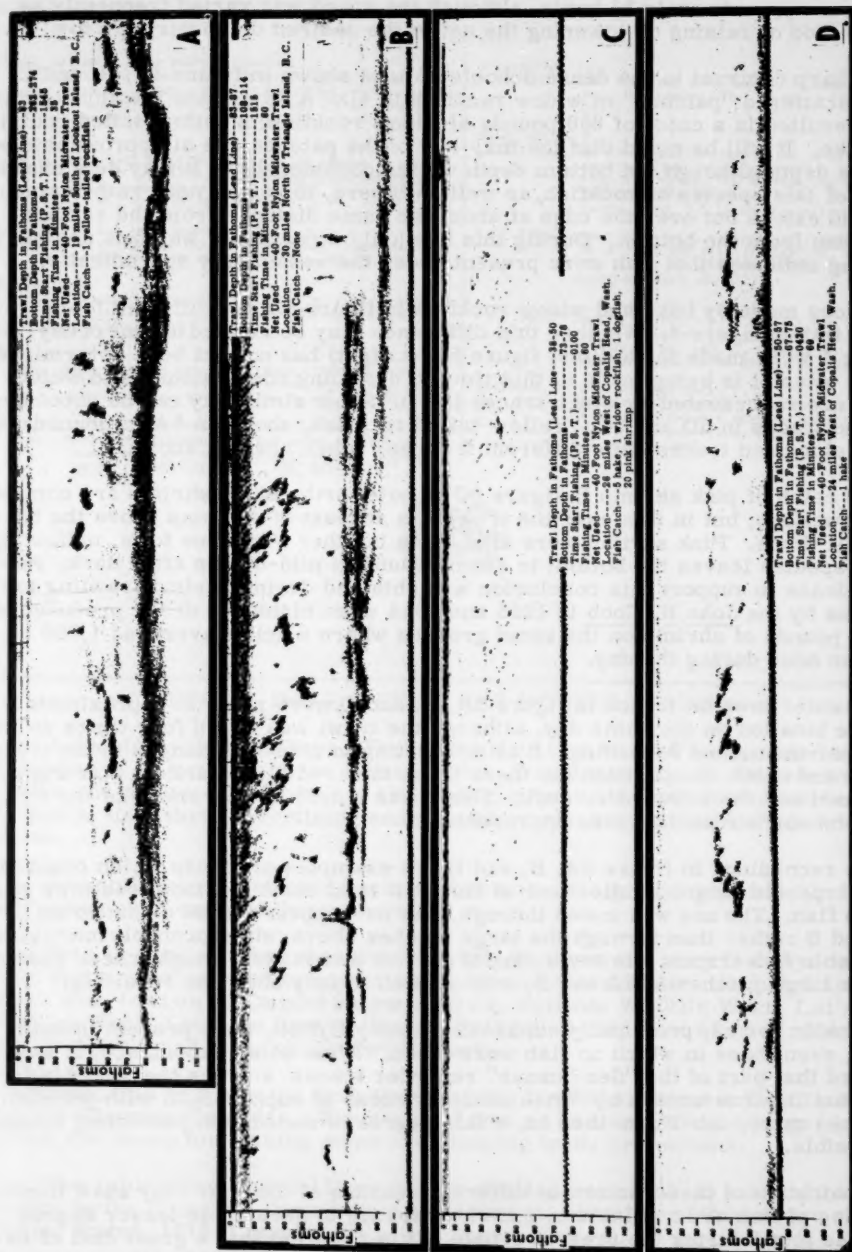


FIG. 6 - "SEA SCANAR" RECORDER TRACES, MADE DURING RELATIVELY UNPRODUCTIVE MIDWATER TOWS, BELIEVED TO HAVE BEEN CAUSED AT LEAST IN PART BY PLANKTON.

Calculated towing speed in figure 4A and C was from  $3\frac{1}{2}$  to 4 knots. Speed in 4B was slightly slower because of wind conditions. Normal towing speed during the cruise was approximately  $3\frac{1}{2}$  knots, although the speed was varied frequently as a quick method of raising or lowering the net to the desired depth during a tow.

In sharp contrast to the dense schools of hake shown in figure 4A, B, and C, are the scattered "patches" of widow rockfish in 4D. A 95-minute tow through these traces resulted in a catch of 850 pounds of widow rockfish, 2 yellow-tailed rockfish, and 1 hake. It will be noted that the majority of the patches are at approximately the same depth although the bottom depth varies considerably. It may be a characteristic of this species of rockfish, as well as others, to gather near rather steep edges and extend out over the edge at about the same distance from the surface rather than from the bottom. During this tow (only a portion of which is shown), the recording indicates that fish were present under the vessel only sporadically.

Traces made by hake and widow rockfish in figure 5D are different from traces of these fish in figure 4. Whether this difference may be related to time of day (tows in figure 4 were made in daytime, figure 5D at night) has not yet been determined. Also, no attempt is being made at this time to draw any conclusions as to which species are represented by which traces in 5D. Some similarity can be noted between the traces in 5D and 6C. Yellow-tailed rockfish, shown in 5A, produced distinctive elongated traces quite different from any other species shown.

The catch of pink shrimp in figure 6C is noteworthy since shrimp are common bottom dwellers, but in this case the trawl was at least 20 fathoms above the bottom at all times. Pink shrimp were also taken in other nighttime tows, indicating that the species leaves the bottom to swim around at mid-depths after dark. Further evidence to support this conclusion was obtained during shrimp trawling explorations by the John N. Cobb in 1955 and 1956 when nighttime drags produced only a few pounds of shrimp on the same grounds where catches averaged 1,000 pounds an hour during the day.

Midwater tows on traces in figure 5B, C, and D were made in approximately the same location on the same day, although the trawl was towed four times as long on the last-mentioned recording. It is interesting to note the changes in the trace patterns and catch composition for these three tows, with the earliest starting before sunset and the latest after dark. There was a definite movement of the fish toward the surface as darkness approached.

The recordings in figure 6A, B, and D are examples of traces which could have been interpreted as good indications of fish, but total catch for the three tows was only two fish. The net was towed through what now appears to be a scattering layer in 6A and B rather than through the large patches above, which probably more closely resemble fish traces. However, in 6D the tow was made through traces resembling the large patches in 6A and B, with a catch of only one hake resulting.

Plankton forms, principally euphausiids and jellyfish, were present in many catches, even those in which no fish were taken. After some experience, it was concluded that part of the "Sea Scanar" recorder traces, such as the layers in figure 6A and B, were caused by dense concentrations of euphausiids, with jellyfish sometimes mixed in. From then on, a fair degree of success in predicting catches was possible.

Exploration of these waters at different seasons of the year may show that other species of fish are available to midwater trawls in greater or lesser degree than those found during the present cruise. It is apparent that a great deal of experience on the local fishing grounds is necessary to properly identify species of fish from traces on the echo recorders, under different conditions and times of day. Suitable electronic fish-finding equipment, competently operated, and an accurate



trawl-depth indicating method are essential items for successful offshore midwater trawling exploration.

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## SPECIAL DAYS, WEEKS, AND MONTHS IN 1958

A booklet--"Special Days, Weeks and Months in 1958"--compiled by the Chamber of Commerce of the United States, Washington, D. C., is now available to the public. The object of this booklet is to aid businessmen and civic groups to tie in their advertising and promotion plans with established observances.

Promotional material for businessmen and civic groups is available from the sponsors of most of these events.

This is quite a comprehensive listing as there are very few days in the year that are not marked by one or more special observances. Included among these are National Canned Salmon Week, National Wildlife Week, Let's Go Fishing Week, Let's Go Hunting Month, National Better Breakfast Month, Picnic Month, and National Sandwich Month.

Also, this year is the first time that the booklet contains a Trade Promotion Planning Calendar. The pages of this calendar contain large blocks which are handy for making notes and planning trade promotions.

The publication "Special Days, Weeks and Months in 1958" is sold at 50 cents a copy by the Domestic Distribution Department, Chamber of Commerce of the United States, 1615 H Street NW., Washington 6, D. C.



### PACIFIC COAST PROGRAM ON THE IRRADIATION PRESERVATION OF FISH--PHASE REPORT

Studies on the use of nuclear radiation for the preservation of fish have been started by the U. S. Bureau of Commercial Fisheries in cooperation with the Quartermaster Food and Container Institute for the Armed Forces. This study is primarily a screening operation to select, for possible initial commercial utilization, those species of fish and shellfish that are most adaptable to this new method of preserving food. Two of the possibilities of fish preservation being investigated are: (1) use of ionizing radiation alone for "cold sterilization;" and (2) use of lower levels of ionizing radiation in combination with some conventional method of processing for "radio pasteurization."

On the Pacific Coast, the potentialities of using nuclear radiation for the preservation of fish is being studied at the Seattle Technological Laboratory and, under contract with the U. S. Bureau of Commercial Fisheries (1) at the Department of Food and Dairy Technology, Oregon State College, and (2) at the Food, Chemical, and Research Laboratories, Seattle, Wash.

All fishery products used in this investigation are irradiated at the Materials Testing Reactor Gamma Irradiation Facility at Idaho Falls, Idaho. The product to be irradiated must be packed in hermetically-sealed cans. These cans are placed in a rack that is lowered into a pool of water about 16 feet deep adjacent to spent fuel elements, the source of gamma rays. After being irradiated, each can is checked for radioactive contamination before being returned to the research laboratories.

At Oregon State College, the research is on the use of ionizing radiation in the preservation of Pacific Coast shellfish and smoked fish. At the Food, Chemical, and Research Laboratories, the research is on the effects of radiation on specific microorganisms that commonly are found associated with Pacific cod (*Gadus macrocephalus*) fillets during storage at the temperature of melting ice.

At the Seattle Technological Laboratory, Pacific cod fillets that have been subjected to increments of ionizing radiation within the dosage range of pasteurization are being studied to determine the effect of such radiation on the shelf life of the fillets at refrigerated temperatures. The irradiated products are being evaluated for changes induced during radiation treatment and in subsequent refrigerated storage by the following tests: (a) organoleptically, for color, flavor, odor, and texture; (b) chemically, for total volatile base, total volatile acid, and trimethylamine; and (c) bacteriologically, for total plate count.

To determine the maximum level of dosage possible before radiation-induced flavors and odors become objectionable, we irradiated cod fillets at levels of 0.23, 0.47, 0.70, 0.93, 1.4, and 1.9 megarads.<sup>1/</sup> Although some radiation odors and flavors were detected in all samples, their intensity generally increased with the level of dosage. The borderline of permissible dosage as judged by the organoleptic acceptability of the fillets appeared to lie between 0.93 and 1.4 megarads.

<sup>1/</sup> A RAD IS AN ABSORPTION OF 100 ERGS PER GRAM OF MATERIAL. A MEGARAD IS A UNIT 1 MILLION TIMES AS LARGE.

In another screening experiment, cod fillets were irradiated at dosage levels of 0.23 and 0.70 megarads to determine their approximate storage life at 32° F. In this experiment, it was found that during storage, the cod fillets darkened slightly as the result of having been irradiated. During the first month of storage, a degradation occurred in the quality of irradiated fillets, owing to the darkening of the white meat and the loss of normal flavor of fresh fish. During the remainder of the shelf life, the white meat continued to darken gradually and the texture became tougher until the product was judged unacceptable. The usual odors and flavors of spoilage were not found. The 0.23 megarad samples had a storage life of about 56 days in ice, and the 0.70 megarad samples a storage life of about 112 days in ice. In contrast, the unirradiated samples had a storage life of 10 to 15 days in ice.

In experiments now in progress, cod fillets were irradiated at either 0.1 or 0.2 megarads to determine their storage life at 35° F. Evaluations of quality are being made by means of organoleptic, chemical, and bacteriological tests. The results will be reported at the conclusion of the tests.

--BY DAVID T. MIYAUCHI, CHEMIST,  
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## TECHNICAL NOTE NO. 43 - CONSIDERATIONS ON THE USE OF REFRIGERATED BRINE FOR CHILLING AND STORING FRESH FISH<sup>1/</sup>

### ABSTRACT

USE OF REFRIGERATED BRINE FOR CHILLING AND STORING FRESH FISH NOW HAS BECOME COMMERCIALY IMPORTANT, OWING TO THE ADVANTAGES IN RAPID COOLING, REDUCED PRESSURES UPON THE FISH, AND LOWERED TEMPERATURES IN COMPARISON TO ICING. THE PRESENT PAPER STRESSES THE NECESSITY OF CONTINUOUSLY MAINTAINING BRINE TEMPERATURES OF 29° TO 31° F. AND OF PROPER CIRCULATION OF BRINE THROUGHOUT THE LOAD IF FISH OF EQUAL OR BETTER QUALITY THAN THOSE STORED IN ICE FOR SIMILAR PERIODS ARE TO BE LANDED.

### BACKGROUND

The use of refrigerated brine<sup>2/</sup> or sea water for preserving fresh fish aboard a fishing vessel is increasing in commercial importance in the Pacific Northwest. This method of holding fish offers a number of potential advantages over the customary stowage of fish in ice. These include (1) greater speed of cooling, (2) reduced pressures upon the fish, (3) lower holding temperatures, (4) greater economy in handling the fish due to time and labor saved, and (5) longer effective storage life of the fish.

### COMPARISON OF KEEPING QUALITY OF FISH IN REFRIGERATED BRINE AND IN ICE

It is important to compare differences between the keeping quality of fish preserved by refrigerated brine and by ice. For this comparison, the temperature range of fish in the brine must be similar to that of the iced fish. With proper icing, the temperature range of the fish varies from 32° to 34° F. For a comparative test, English sole (*Parophrys vetulus*) from a single haul were divided into two lots. One lot was heavily iced, and the second lot was placed in refrigerated brine (3 percent salt by weight) at a temperature ranging from 32° to 35° F. Examinations

<sup>1/</sup> PART OF THE WORK REPORTED WAS FINANCED BY FUNDS PROVIDED BY THE SALTONSTALL-KENNEDY ACT OF 1954. WORK WAS PERFORMED BY THE SCHOOL OF FISHERIES, UNIVERSITY OF WASHINGTON, SEATTLE, WASH., UNDER CONTRACT FROM THE U. S. FISH AND WILDLIFE SERVICE.

<sup>2/</sup> APPROXIMATELY 3 PERCENT SALT BY WEIGHT.

NOTE: CONTRIBUTION NO. 33, SCHOOL OF FISHERIES, UNIVERSITY OF WASHINGTON, SEATTLE.

of these fish indicated that both lots remained in an edible condition for 13 to 16 days. Additional tests with English sole held in refrigerated sea water at 32° to 35° F. produced similar results. Thus, brine or sea water appeared to have no special properties for extending the storage life of fish when its temperature was within the range of that of fish held in ice.

### ANTIBIOTICS

The possibility of adding tetracycline antibiotics to chilled brine as an aid to preservation of fish has been investigated at laboratories throughout the world. Use of antibiotics for the preservation of fish, however, is not permitted by the U. S. Food and Drug Administration. Accordingly, the use or presence of antibiotics in fish renders them subject to seizure.

### IMPORTANCE OF TEMPERATURE CONTROL

From the viewpoint of keeping quality, the real advantage of refrigerated brine appears to be that the brine temperature can be lowered to 29° to 30° F., or just



FIG. 1 - EXPERIMENTAL INSTALLATION OF REFRIGERATED SEA-WATER TANKS AT THE SEMIAHMOO CANNERY OF ALASKA PACKERS ASSOCIATION, BLAINE, WASH. THE FIVE DRUMS HELD THE FISH IN REFRIGERATED SEA WATER. THE DRUMS ARE CHILLED BY THE CIRCULATION OF THE SEA WATER IN THE LARGE WOODEN VAT.

above the point at which the fish begin to freeze. The importance of this characteristic is related to the observation that temperatures near 32° F. are critical in the storage of fish. Bacterial and enzymatic activity is greatly depressed at temperatures slightly below 32° F. and greatly increased at temperatures slightly above 32° F. The importance of this factor in relation to proper control of temperature and to the keeping quality of fish held in brine can be seen from the following examples: If fish, immediately upon capture, were placed in refrigerated brine at temperatures of 29° to 31° F., it would be expected that the fish could be maintained in an edible condition for about 21 to 28 days, depending upon the species, and whether or not the fish were eviscerated. If the temperature of the brine were 34° to 36° F., however, the expected storage life would be approximately 10 days; and if the temperature were 36° to 38° F., the expected life would be approximately 7 days. For this reason, a temperature range of 29° to 31° F. is recommended for use with refrigerated brine.

### NEED FOR PROPER EQUIPMENT

To take full advantage of the potential of refrigerated brines, the user must give attention to the selection of equipment and its operation. Recent work in our laboratories with English sole, true cod, and sockeye salmon (figure 1), and in other laboratories with other species, has indicated that difficulties may be encountered in the use of refrigerated brine storage aboard commercial fishing vessels unless appropriate equipment is available and is operated in a proper manner.



It is possible to obtain and maintain the recommended temperature range by the use of properly engineered and operated refrigerated brine systems. With all refrigeration systems, however, the temperature range of the cooling coils varies between the cut-off and cut-on points of the compressor. The brine temperature normally will be higher than the coil temperature, and the temperature fluctuation of the brine will be smaller than that of the coils, assuming efficient brine circulation and proper tank insulation. With installations in which the brine temperature is controlled by a thermostat in the brine, the thermal inertia of the mass of brine will cause slightly greater fluctuations in the brine temperature than the range for which the thermostat is adjusted. With good equipment and proper controls, the range of temperature variation of the brine may be reduced to 2° F. If the mid-temperature is adjusted to 30° F., the brine therefore will have a maximum of 31° F. and a minimum of 29° F.

With inadequate refrigeration, inefficient brine circulation, or poor thermostat control, the fish is in danger of spoiling, owing to the effect of brine temperatures above 32° F. If continuous refrigeration is not available in combination with adequate brine circulation, local "hot" spots may develop in the corners or at the bottom of the tank. Fish in these locations may deteriorate rapidly. A danger also exists if the refrigeration capacity is not adequate to maintain continuous low brine temperatures during periods of peak loading. In tanks lined with refrigerated coils, poor circulation may lead to excessive icing of the coils which in turn lessens the efficiency of heat transfer from brine to coils. Unrestricted, vigorous circulation of brine around the coils is essential at all times. If proper equipment and temperature control cannot be maintained to provide adequately low temperatures uniformly throughout the brine under all conditions of loading, the addition of crushed ice to the brine will be necessary to insure against loss of quality.

#### SPOILAGE PATTERN

When fish are stored in refrigerated brine, the development of spoilage appears to be essentially the same as when fish are held with ice. There are, however, slight differences. Usually, there is an odor of hydrogen sulfide emanating from the gill area of fish in the round that have been stored in refrigerated brine. This odor is believed to be due to the growth of anaerobic bacteria in the gill tissue and slime. Normally, in ice, such odors may be dissipated by the bathing action of the melting ice and the drainage of blood and slime to the bilge; or they may not be produced, for the anaerobic bacteria are not able to grow in the presence of air.

Generally, this sulfide odor is not important in estimating the quality of fish, as it is restricted to the nonedible gill area and dissipates upon short exposure to air. Upon long storage in brine, however, the odor becomes apparent in the meat of the fish and, at that time, is indicative of spoilage.

If the fish are dressed (gills and viscera removed), this sulfide or anaerobic type of spoilage is less likely to occur, since the viscera and the bloody mass of the gills provide not only a higher level of contamination but also are more apt to spoil under anaerobic conditions. On the other hand, dressed salmon held in refrigerated brine for long periods may show bleaching or "washing-out" of the meat color in the belly walls as well as greater absorption of salt in these areas.

Proper cleaning and sanitation of the brine tanks, coils, and circulation system at the end of every trip or load is most important. Otherwise a heavy inoculation of bacteria may be carried over into the next load of fish. Both a good detergent and a chlorine-type sanitizing agent should be used.

The rate of formation of certain spoilage compounds, including hydrogen sulfide, depends not only upon the methods used to handle and dress the fish but also upon the type of refrigerated brine system used--whether circulating brine, still

brine, or aerated brine. Further investigation, however, will be necessary to establish the relationship between the type of refrigerated brine system used and the patterns of spoilage that develop.

Current studies at the Seattle Technological Laboratory include consideration of these factors in addition to the relation of prior storage of fish in chilled brines to their subsequent keeping quality if iced or frozen for later marketing purposes. Present evidence indicates that if use of chilled brine storage is restricted to improving the quality of fish when landed, there is no problem in subsequent handling under good commercial practice.

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### WHITING FILLETS

Whiting is a lean fish that cooks easily and quickly, whether fried, baked, or broiled. One of the popular forms in which this fish can be purchased is as fillets--fresh or frozen in the handy one-pound consumer package or in the economical five- and ten-pound packages for those who wish to stock their freezers.



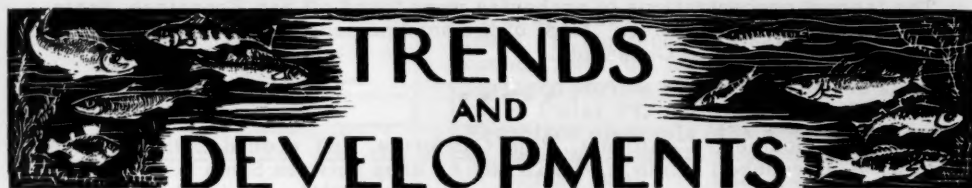
The frozen fillets are used quite extensively throughout the eastern half of the United States, and particularly in the Middle West where they are featured in fried fish sandwiches.

The home economists of the U. S. Bureau of Commercial Fisheries suggest that you serve Pan-Fried Whiting as the main course for a dinner.

#### PAN-FRIED WHITING FILLETS

- |                            |                           |
|----------------------------|---------------------------|
| 2 POUNDS WHITING FILLETS   | 1 TEASPOON SALT           |
| 1 TABLESPOON MILK OR WATER | 1 CUP DRY BREAD CRUMBS,   |
| DASH PEPPER                | CRACKER CRUMBS, CORNMEAL, |
| 1 EGG, BEATEN              | OR FLOUR                  |

Combine egg, milk, and seasonings. Dip fish in egg mixture and roll in crumbs. Place fish in a heavy frying pan which contains about  $\frac{1}{2}$  inch of fat, hot but not smoking. Fry at moderate heat. When fish is brown on one side, turn carefully and brown the other side. Cooking time approximately 10 minutes, depending on thickness of fish. Drain on absorbent paper. Serves 6.



# TRENDS AND DEVELOPMENTS

## California

AIRPLANE SPOTTING FLIGHTS STUDY ABUNDANCE AND DISTRIBUTION OF PACIFIC SARDINES AND ANCHOVIES: Inshore Area between San Francisco and San Diego (Flight 57-8, Cessna "170" 1359D): Pelagic fish distribution, abundance, and behavior (with particular emphasis on Pacific sardine and anchovies) were studied by California Department of Fish and Game airplane spotting flight 57-8 between September 16-20, 1957. The area surveyed was the inshore waters between San Francisco and San Diego. The second purpose of the flight was to experiment with aerial photography as a method of determining and recording the area (in square feet) of fish schools from the air.

Anchovies were more abundant and widespread in Central California than on any other flight over the past three years. Two very large concentrations were observed in Monterey Bay and in the area between Avila and Point Sal. From the reports of commercial and sport fishermen, it was determined that these large masses of fish (as well as the smaller schools scattered all along the coast) are mainly of the 1957 year-class anchovies. This year-class appears to be stronger than the 1954 year-class which was the strongest in Central California since the study of anchovies was started in 1952.

Many schools of 0-age group (1957-year class) anchovies have appeared in Southern California also, but apparently not in as great numbers as in Central California. As on the previous flight (57-7) anchovies were very scarce in the area between San Pedro and San Diego.

Mixed sardine and Pacific mackerel schools were located off Goleta and sardine schools continued to show in scattered amounts along the coast south of Newport. No sardines were seen off Point Mugu where a large school group was observed on the previous flight.

In general, far fewer schools of all species were seen in Southern California than on the last flight. This is probably due to the fact that there was a period of four days of strong winds prior to and during the first two days of the flight. Recent studies on variations in numbers and size of fish schools in a given area has pointed to the fact that winds do tend to make the fish schools remain deeper in the water and thus much harder or even impossible to see. On the last day of the flight calm weather prevailed and fish schools were seen in areas where two days earlier no schools were present.

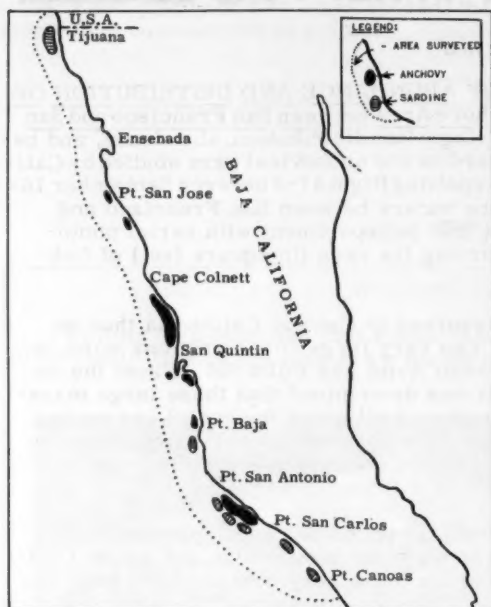
Aerial pictures of anchovy and sardine schools taken on Kodacolor-type film showed improvement over pictures taken on previous flights using color negative-type film. The fish schools on Kodacolor positives were not as sharply defined as those on color negative-type film; however, dim schools that do not appear on color negative film do appear on the Kodacolor film and their area can now be determined by aerial photographs.

During the course of the study made along the Central and Southern California shoreline, 830 anchovy schools (5,604,000 square feet), 53 sardine schools (224,000 square feet), and 9 schools of other species were observed.

The largest concentrations of anchovies were found off San Francisco, Santa Cruz, Avila, Oceano, and Goleta. Most of the sardine schools were sighted off San Clemente, San Onofre, and Oceanside.

\*\*\*\*\*

Areas off Southern California, Baja California, and around Catalina Island (Flight 57-9, Beechcraft 4758N.): The inshore area between Santa Barbara and



AIRPLANE SPOTTING FLIGHT 57-9 (SEPT. 24-28, 1957)

Newport, Calif., the inshore area between San Diego, California and Pt. Canoas, Baja California, and the offshore area around Catalina Island, and in the channel between the island and the mainland was surveyed by California Department of Fish and Game airplane spotting flight 57-9 between September 24-28, 1957. To determine relative abundance and distribution of pelagic fish, with particular emphasis on the Pacific sardine and northern anchovy, was the purpose of the flight.

Scouting in Baja California was hampered due to low fog which extended over the entire coast south of San Diego on both the 24th and 25th. Clear weather was encountered on the 26th in all areas to the north of Pt. Canoas and good coverage of this area was made.

Anchovy schools were less numerous in this same area as compared to last year. In 1956 the largest school groups were in the area between Cape Colnett and Pt. Baja, but on this flight the large concentrations were disposed

to the south between Pt. Baja and Pt. Canoas. Most of the schools seen in this area were anchovies but some of them appeared "sardine-like" in shape and color. Positive identification of all the schools was not possible and no commercial fishermen were working in the area to confirm the identity of the kind and sizes of fish present. Some estimate, however, will be obtained by the research vessel N. B. Scofield which surveyed this area several days later.

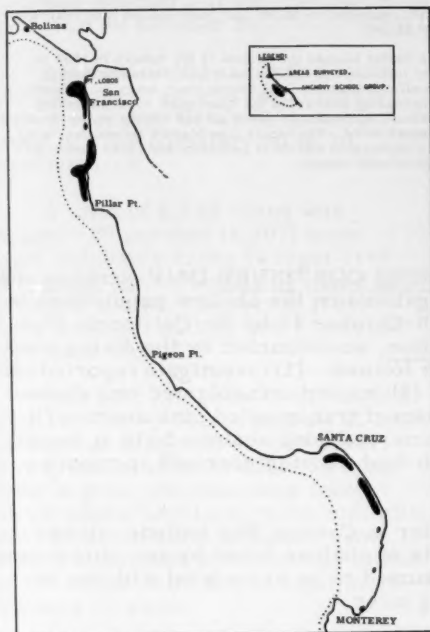
On the flight from San Diego to Santa Catalina Island two sardine schools were sighted in mid-channel, but no schools were seen around the island.

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Inshore Area between Carmel Point and Point Reyes (Flight 57-11, Cessna 3236C): The inshore area between Carmel Point and Point Reyes was surveyed from the air on October 22, 1957, for concentrations of young anchovies and sardines by the California Department of Fish and Game. In addition, a study was made to determine the feasibility of estimating ocean sportfishing intensity by aerial censusing.

Weather conditions were unfavorable for fish scouting as 15- to 20-knot winds prevailed and heavy overcast covered all the area to the north of Santa Cruz.





AIRPLANE SPOTTING FLIGHT 57-11 (OCT. 22, 1957)

Three school groups of anchovies were found. In Monterey Bay 329 schools were counted, with the majority occurring in the northern portion of the Bay. In the area between Pillar Pt. and Pt. Lobos, off the San Francisco peninsula, 454 schools were sighted, and three schools of anchovies were found in Bolinas Bay. The tally for Monterey Bay was about one-third that of the previous flight (57-10) when over 1,100 schools were seen. Most probably the inclement weather accounted for the fewer schools this flight.

On the return flight from Pt. Reyes to Carmel Pt. the plane was flown along the beach to make a census of sportfishermen. In all, 25 surf casters, 10 rock fishermen, 61 pier fishermen, 5 sportfishing skiffs, and 5 party boats were tallied. The fishermen were very easily spotted. It was possible to count individual fishing poles being used on piers, on the beaches, and rocks, but it was difficult to determine the poles being used in the skiffs, although the number of individuals in each skiff was easily determined.

NOTE: SEE COMMERCIAL FISHERIES REVIEW, JANUARY 1958, P. 29, FOR FLIGHT 57-10.

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**CURTAILMENT OF SPORT FISHERY FOR SALMON IN 1958 SUGGESTED:** The California Department of Fish and Game announced Nov. 29, 1957, that it is considering asking the Fish and Game Commission in January to curtail slightly the sports take of salmon in the 1958 season.

The announcement came in a nine-page report "Status of the Salmon Resources--1957, A Report to the People of California" on the critical salmon situation. The report pointed out that in 1957 both the sport and commercial fishermen suffered sharp declines from the previous year in their ocean landings of king salmon. The poor fishing year was coupled with a prediction that 1957 will be "a second consecutive poor spawning year."

"Spawning stocks in 1957 could be the smallest on record if preliminary catch figures and early spawning reports prove to be accurate indicators," the report said.

Early in 1957 the Department called attention to a drastic drop in spawners in 1956 over the previous year and warned that if the spawning count did not increase sufficiently in 1957 the salmon stocks would be in sufficient danger to warrant added protection. "Needed annually are 500,000 spawners; the figure last year was 200,000," the report said.

Restriction of commercial fishing by removal of gill-nets from the Sacramento River (by Act of the 1957 Legislature) will not help the spawning picture until next fall, the report noted, and also pointed out that "the progeny of these salmon will not appear in the fisheries for another two or three years--or until 1960 or 1961 when they have grown to legally-catchable sizes."

The report said three possible recommendations for submission to the Commission are under consideration by the Department. (The Commission can control only the sports take of salmon; the commercial take is regulated by the Legislature.) The three are:

(1) Enabling more salmon to escape to the spawning grounds by: (a) shortening of seasons, or (b) reducing the

catch by making the sport bag limit two fish (present bag limit is three).

(2) Assuring further spawning survival by extension of spawning area closures.

(3) Allowing more young salmon to grow to maturity by raising the minimum size limit of sport-caught ocean fish to 26 inches (the commercial minimum) from its present 22 inches.

Poor salmon fishing extended coastwise as far north as Alaska in 1957. Because of what the report terms "a serious decline of salmon stocks all along the coast," the Pacific Marine Fisheries Commission recommended to the member states of Washington, Oregon, and California on November 20 that all ocean sport fishing seasons be shortened to coincide with the commercial seasons.

"Oregon and Washington have indicated that substantial curtailment will be effected (by shortening the sport seasons), which will afford additional protection to salmon of California origin," the report said. Fish spawned in the Sacramento River are taken in the ocean north of California in substantial quantities and a recent marking experiment has shown that this figure could be as high as 35 percent of the Sacramento River catch.

The report showed 1,500,000 salmon, an all-time high, were landed in 1956 by commercial and recreational fishermen in California rivers and in the ocean. The 41-year average (1916-1956) is 800,000 fish annually. Lowest year was 1939 when only 300,000 fish were landed. The total for 1957 is expected to barely reach the 600,000 level.

This was the gloomy fishing picture as the report noted for 1957:

(1) The fish have been much harder to catch in 1957. Ocean commercial boats averaged only about 90 fish a month, compared to the 260 fish they averaged during the previous four years.



(2) Party boat landings of ocean salmon through September were less than half of the average of the last four years--43,000 fish, compared to 103,500.

(3) Commercial ocean landings were 519,700 fish--down 507,500 from last year's record high and down from the four-year average by about 368,400.

(4) Even though it was their last year in the river, gill-netters found fishing tough. They took only 16,000 king salmon

in 1957, compared to 55,000 last year and the four year--average of 65,400.

The report blamed the decline of the fishery in 1957 on "many increased pressures on stocks, including fishing." More efficient commercial fishing gear, many more boats, and increasing interest of the sportsmen in ocean fishing for salmon in the last 10 years all had effects on the stocks, the report noted. The report also blamed natural mortality, the immeasurable effects of pollution, and other unseen and uncontrollable losses.

\* \* \* \* \*

INVESTIGATIONS OF ABALONE RESOURCES CONTINUED (M/V Nautilus and Diving Boat Mollusk, Cruise 57-N-5): Investigations on the abalone populations in California waters were continued from June 10-October 10 by the California Fish and Game Department's research vessel Nautilus, accompanied by the diving boat Mollusk. The objectives of the cruise were as follows: (1) investigate reported abalone predations by sea otters in Carmel Bay; (2) inspect transplanted red abalone (*Haliotis rufescens*) at Catalina Island; (3) inspect transplanted pink abalone (*H. corrugata*) at Catalina Island; (4) inspect commercial pink abalone beds at Santa Barbara Island; (5) familiarize personnel with Scuba diving gear and to practice with this equipment.

There seems to be little doubt that sea otter in Carmel Bay include a large number of red abalone in their diet. The shells of abalone eaten by sea otters have a characteristic breakage pattern which is assumed to be associated with the removal of the abalone from the rocks by the sea otter.

The transplanted red abalone at the Isthmus, Catalina Island, were sampled for indication of growth. These abalone have apparently adapted themselves to the new environment and several had put on additional growth to the shell.

Pink abalone transplanted by the investigation in February 1957 were inspected and growth measurements made. It was noted that the tag used to mark these individuals does not hold up although not subject to abrasion. New type tags are being designed and it is planned to use these in future operations.

A period of windy weather, which built up a swell, made diving impractical and it was impossible to examine the commercial abalone beds at Santa Barbara Island during the time scheduled for this operation.

Personnel were able to practice extensively with the Scuba equipment and utilization of this apparatus greatly facilitates the extensive exploratory work necessary to inspect areas where abalone are found in and around the Channel Islands.

\* \* \* \* \*

STUDY OF PRESEASON DUNGENESS CRAB POPULATION (M/V Nautilus Cruise 57-N-6): Taking of preseason samples of adult and juvenile Dungeness or market crabs (*Cancer magister*) to determine the relative abundance, size composition, and condition of the preseason crab population was the purpose of the October 14-26, 1957, cruise of the California Department of Fish and Game research vessel Nautilus. The area studied was the Central California Coast between Bodega Bay and Pedro Pt.

A total of 42 crab traps were used on this cruise--22 of the 36-inch traps were rigged with 25 fathoms and 20 of the 42-inch traps were rigged with 50 fathoms of line. The traps were set in two strings: the smaller ones in shallow water, 10 to 15 fathoms; the larger ones in deeper water, 15 to 30 fathoms.

Bad weather caused the loss of three 36-inch traps on October 18, and one 42-inch trap on October 26.

An eight-foot beam trawl with one-inch mesh net was used to catch juvenile crabs. Seven tows were made of approximately 20 to 30 minutes each.

A total of 5,180 crabs was caught--85 percent (4,407) were legal catchable crabs (a legal crab is a male, seven inches or more in greatest width), 13 percent (690) were sublegal males, and 1 percent (83) were females.

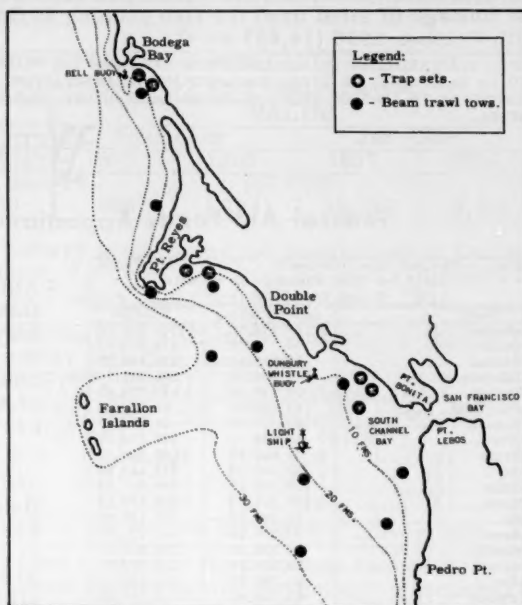
The percentage of "soft" legals was 14. The greatest portion of soft crabs was caught in deeper water. The greatest number of soft crabs, from a given location, was taken 7 miles west of the Duxbury Reef whistle buoy in 29 fathoms of water. The smallest number was found  $5\frac{1}{2}$  miles north of the Point Reyes light in 16 fathoms of water.

Twenty-nine percent of the legal crabs were barnacled, while 28 percent of the sublegal males were barnacled. These crabs had not recently molted and were in good condition. A crab was called barnacled when three or more barnacles, of five millimeters or more in diameter, were found on it.

There was an average of 19 legal crabs per trap. The commercial trap samples for November of the two preceding seasons were: 1956/57, 23 crabs per trap; and 1955/56, 16 crabs per trap. The 1956/57 season was a record year.

A legal crab measured by shoulder width (measured just in front of the last spines) is approximately 156 to 162 millimeters wide, depending on the general shape and spine-length.

The average shoulder width of legal crabs caught in the traps was 178.3 millimeters. The average for the sublegals was 147.2 millimeters, and for the females, 143.6 millimeters. Compared to commercial trap samples taken at the same season of previous years, this year's crab sizes are larger than those of the 1954/55, 1955/56, and 1956/57 seasons. The 1957/58 season will be another "jumbo crab" year.



M/V NAUTILUS CRUISE 57-N-6 (OCTOBER 14-26, 1957)



### Cans--Shipments for Fishery Products, January-October 1957



Total shipments of metal cans during January-October amounted to 103,021 short tons of steel (based on the amount of steel consumed in the manufacture of cans) as compared with 100,876 tons in January-October 1956. Canning of fishery products in October was confined largely to tuna, California sardines, shrimp, and Pacific

mackerel. The pack of California sardines was quite light this October as compared with the same month a year ago. This situation may account for the sharp drop in the tonnage of steel used for fish canning in October 1957 (3,133 tons) as compared with October 1956 (14,857 tons).

NOTE: STATISTICS COVER ALL COMMERCIAL AND CAPTIVE PLANTS KNOWN TO BE PRODUCING METAL CANS, REPORTED IN BASE BOXES OF STEEL CONSUMED IN THE MANUFACTURE OF CANS, THE DATA FOR FISHERY PRODUCTS ARE CONVERTED TO TONS OF STEEL BY USING THE FACTOR: 23.0 BASE BOXES OF STEEL EQUAL ONE SHORT TON OF STEEL.



### Federal Aid Funds Apportioned to States Revised

Table 1 - Revised Apportionments of Federal Aid Funds to States for Sport Fishing and Wildlife, Fiscal Year 1958

State	Sport Fishing	Wildlife
Alabama . . . . .	\$ 89,274.56	\$ 300,023.00
Arizona . . . . .	78,730.56	375,076.95
Arkansas . . . . .	82,841.10	285,494.55
California . . . . .	216,600.00	809,941.70
Colorado . . . . .	99,309.04	455,706.45
Connecticut . . . . .	43,320.00	84,870.00
Delaware . . . . .	43,320.00	84,870.00
Florida . . . . .	95,038.11	237,316.91
Georgia . . . . .	77,680.36	269,948.08
Idaho . . . . .	68,087.03	314,566.92
Illinois . . . . .	130,586.27	466,351.83
Indiana . . . . .	134,303.53	499,620.22
Iowa . . . . .	80,399.82	375,135.99
Kansas . . . . .	71,576.05	340,231.08
Kentucky . . . . .	76,935.83	269,268.77
Louisiana . . . . .	55,967.79	278,978.51
Maine . . . . .	45,187.97	193,344.56
Maryland . . . . .	43,320.00	115,995.69
Massachusetts . . . . .	43,320.00	92,026.36
Michigan . . . . .	206,436.14	848,700.00
Minnesota . . . . .	216,600.00	540,635.52
Mississippi . . . . .	46,754.98	238,133.39
Missouri . . . . .	112,381.71	404,951.85
Montana . . . . .	105,511.32	524,844.16
Nebraska . . . . .	68,050.88	311,882.68
Nevada . . . . .	62,047.50	328,324.99
New Hampshire . . . . .	43,320.00	84,870.00
New Jersey . . . . .	43,320.00	120,229.94
New Mexico . . . . .	73,866.00	384,837.19
New York . . . . .	126,184.99	709,502.55
North Carolina . . . . .	77,969.77	348,952.84
North Dakota . . . . .	45,344.72	258,400.26
Ohio . . . . .	143,306.98	515,556.94
Oklahoma . . . . .	94,845.84	301,533.05
Oregon . . . . .	94,122.30	430,175.35
Pennsylvania . . . . .	121,930.14	672,440.90
Rhode Island . . . . .	43,320.00	84,870.00
South Carolina . . . . .	53,014.88	175,959.04
South Dakota . . . . .	57,635.91	312,053.60
Tennessee . . . . .	121,230.16	387,678.84
Texas . . . . .	200,178.19	848,700.00
Utah . . . . .	59,520.18	320,371.06
Vermont . . . . .	43,320.00	84,870.00
Virginia . . . . .	72,392.33	336,762.22
Washington . . . . .	91,763.40	368,076.52
West Virginia . . . . .	43,320.00	228,450.79
Wisconsin . . . . .	172,139.87	516,995.92
Wyoming . . . . .	73,053.79	351,602.83
Hawaii . . . . .	43,320.00	84,870.00

Revised apportionments of Federal Aid funds to the states for restoration of fish and game were announced on December 31, 1957, by the U. S. Department of the Interior. The new apportionment is based on revised Treasury certifications of money available from excise taxes on certain sporting goods.

Under the revisions, the 48 States and Hawaii will receive \$21,306,000 for fish and game restoration instead of the \$25,130,000 previously announced. The revised figure for game restoration is \$16,974,000 instead of the \$19,130,000 allotted previously; the amount available for the restoration of fish is \$4,332,000 instead of \$6,000,000.

In addition to the above apportionments, Alaska is to receive \$90,000 for game restoration and \$75,000 for its sport fishery. Guam, Puerto Rico, and the Virgin Islands will each receive \$12,000 for game restoration and each will get \$10,000 for fish restoration. These amounts are fixed by law rather than by formula.

The revised apportionment appears in the table.

NOTE: ALSO SEE COMMERCIAL FISHERIES REVIEW, NOVEMBER 1956 P. 30 AND DECEMBER 1957 P. 18.



### Federal Purchases of Fishery Products

**DEPARTMENT OF DEFENSE PURCHASES, JANUARY-NOVEMBER 1957:**  
**Fresh and Frozen Fishery Products:** For the use of the Armed Forces under the Department of Defense, 1.4 million pounds (value \$686,000) of fresh and frozen fishery products were purchased in November by the Military Subsistence Market Centers. This was lower than the purchases in October by 14.7 percent and 36.6 percent less than the purchases in the same month a year earlier. The value of the purchases this November was lower by 15.2 percent as compared with the previous month and lower by 38.7 percent from November a year earlier.

For the first nine months of 1957 purchases totaled 26.7 million pounds, valued at \$11.2 million--a decrease of 11.4 percent in quantity and 9.3 percent in value as compared with the same period of 1956.

Table 1 - Fresh and Frozen Fishery Products Purchased by Military Subsistence Market Centers, November 1957 with Comparisons

QUANTITY				VALUE			
November		Jan.-Nov.		November		Jan.-Nov.	
1957	1956	1957	1956	1957	1956	1957	1956
..... (1,000 Lbs.)		.....		..... (\$1,000)		.....	
1,372	2,163	21,696	24,580	686	1,184	11,177	12,321

Prices paid for fresh and frozen fishery products by the Department of Defense in November averaged 50.0 cents a pound, 0.3 cents less than the 50.3 cents paid in October, and 1.7 cents lower than the 51.7 cents paid during November 1956.

Table 2 - Canned Fishery Products Purchased by Military Subsistence Market Centers, November 1957 with Comparisons

Species	QUANTITY (1957)		VALUE (1957)	
	November	Jan.-Nov.	November	Jan.-Nov.
	... (1,000 Lbs.)		... (\$1,000)	
Tuna	1/ 339	2/ 2,221	120	3/
Salmon	835	3,111	506	3/
Sardine	68	193	23	3/
1/ ALL TUNA AND NOODLES. 2/ INCLUDES 339,000 POUNDS OF TUNA AND NOODLES. 3/ UNAVAILABLE.				

**Canned Fishery Products:** Salmon and tuna were the principal canned fishery products purchased for the use of the Armed Forces during November. Purchases of canned salmon are usually concentrated in the fall months following the end of the salmon packing season. (See table 2.)



### Frozen Foods

**EFFECTS OF TEMPERATURE FLUCTUATIONS AND STORAGE TIME STUDIED:** The effects on frozen foods of temperature changes and length of time in cold storage is under study by the U. S. Department of Agriculture's Western Utilization Research and Development Division at Albany and Pasadena, Calif., with wide industry cooperation. The studies are planned to give comprehensive new knowledge of the changes that may occur in frozen foods between the processing plant and the ultimate consumer.

Commercially-packed samples of frozen foods from major producing areas over several seasons are being used in the tests. Changes in quality of foods held under a wide range of temperatures--from 0° F., or lower, up to defrosting temperatures and higher--are investigated with special care.

The rapidly growing frozen-food industry needs to know the answers to such questions as: (1) How can top quality be pro-

tected by modifications of handling, packaging, and other operations? (2) Can research develop tests that measure losses at various stages in the storage and distribution of frozen foods, and thus aid in nationwide improvement? Besides helping to answer these questions, much of the new information developed in the "time-temperature-tolerance" studies is useful also in homes and restaurants.

Frozen foods, the researchers point out, decline from top quality as a result of several kinds of change, all of which move increasingly faster as temperature rises. They are barely active at 0° F., but they accelerate at various rates with rising temperature. In fact, some double in rate several times between 0° and 25° F. Damage to foods can result from long exposure to mild temperatures, just as readily as from shorter exposures to more severe temperatures. Also, damage from successive exposures adds to an accumulated total. Quality losses may continue to occur at 15° to 25° F. even in frozen foods that feel solid.



### Great Lakes Fishery Investigations

**WESTERN BASIN OF LAKE ERIE SURVEYED (M/V Cisco Cruise 9):** Fish populations of the western basin of Lake Erie were surveyed by the U. S. Bureau of Commercial Fisheries research vessel Cisco between October 15-28, 1957. As compared with Cruise 7 (September 3-15, 1957), the last time the area was covered, catches were characterized by generally fewer sheephead, channel cat-



fish, and white bass, and more silver chubs and smelt, with no notable differences in the other species. Although there was an increase in smelt, there was no indication of a general movement into the western basin.

Bottom trawling operations were carried out in 8 areas, including one station in Sandusky Bay. Yellow perch were the most abundant species taken in the trawls. The largest catch of the year for this species was made south of Middle Sister Island, where in a 15-minute tow 3,900 yearlings and 274 older perch, totaling 475



CISC0, RESEARCH VESSEL OF THE SERVICE'S GREAT LAKES FISHERIES INVESTIGATIONS.

pounds, were caught. Other species taken regularly were walleye, silver chub, emerald shiner, spottail shiner, carp, white bass, smelt (mostly yearlings), sheepshead, trout-perch, gizzard shad, and alewife. Species taken less commonly were pumpkinseed (1), black crappie, smallmouth bass (1 fry), white crappie (Sandusky Bay only), white sucker, blunt-nose minnow (Sandusky Bay only), goldfish, channel catfish, brown bullhead, lake herring (1), burbot (1), johnny darter, logperch, and mooneye (*Hiodon tergisus*) 1/. The latter species, only one

of which was taken, came from Sandusky Bay and was the first of the year.

Experimental nylon gill nets 250 feet long were set obliquely from top to bottom in 40 feet of water southeast of Kelly's Island and in 40 feet of water east of Pelee Island. Near each of these nets another gill net containing several mesh sizes was set with its float line 6 feet beneath the surface. The oblique net off Kelly's Island caught 2 perch, 2 walleyes, and 1 white bass in the top half and 10 perch, 2 walleyes, 8 sheepshead, 8 gizzard shad, 2 smelt, 1 alewife, and 1 channel catfish in the bottom half. The gill net 6 feet below the surface in the same area took 28 gizzard shad, 23 walleyes, 11 white bass, 4 smelt, 2 alewives, 2 channel catfish, and 1 yellow perch. The oblique net of Pelee Island took 29 large perch in the bottom 10 feet, 4 perch between 20 and 30 feet, 1 alewife near the surface, and 17 smelt and 7 sheepshead scattered throughout. The net nearby, suspended 6 feet beneath the surface, caught 22 smelt, 9 sheepshead, 5 gizzard shad, and 1 walleye.

The water in western Lake Erie cooled rapidly during Cruise 9. Surface temperatures ranged from 9.6° C. (49.3° F.) to 15.7° C. (60.3° F.). There was no thermal stratification in any of the area covered.

This area will not be visited again this season.

1/ FOR SCIENTIFIC NAMES OF OTHER SPECIES, SEE COMMERCIAL FISHERIES REVIEW, NOVEMBER 1957, P. 20.



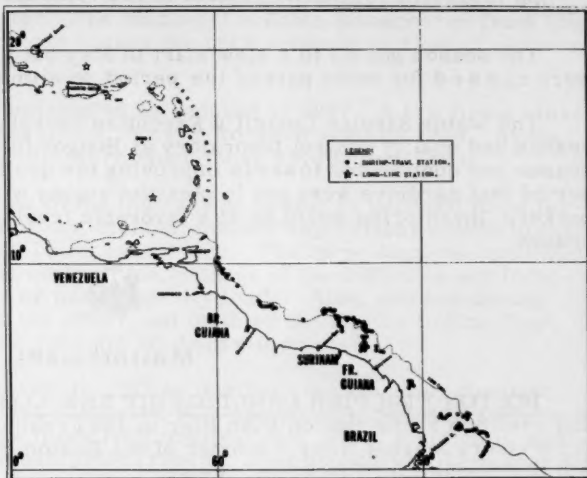
### Gulf Exploratory Fishery Program

TUNA AND SHRIMP SURVEY IN EASTERN CARIBBEAN AND OFF NORTH-EAST COAST OF SOUTH AMERICA (M/V Oregon Cruise 47): Tuna and shrimp resources were sought in the eastern Caribbean and off the northeast coast of South America during a 7½-week exploratory fishing cruise of the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon. The cruise ended December 7, 1957.

Five 600-hook tuna long-line sets were made between Navidad Bank (just north of the Dominican Republic) and the southeastern Caribbean. The highest catch rate was obtained off Bird Island in the Caribbean where 111 yellowfin and one albacore tuna were landed--a catch rate of 22.4 tuna per 100 hooks. With the exception of one 125-pound yellowfin, the other fish uniformly ranged from 60 to 80 pounds each.



A total of 113 exploratory shrimp trawling tows were made between Trinidad and the Amazon River. All tows were made with 40-foot shrimp trawls and no attempt was made to fish on a commercial scale. Seventy-one tows were made in 10- to 100-fathom depths. Large (7 to 20 count heads on) pink shrimp (*Penaeus duorarum*<sup>1/</sup>) were taken in 23 to 75 fathoms over the entire range. Catches varied from less than one to about 20 pounds per  $\frac{1}{2}$ - to 1-hour tow. Catches in the 15- to 40-fathom range between Surinam and the Amazon River also contained large (10 to 35 count) grooved shrimp (*Penaeus brasiliensis*<sup>1/</sup>), up to 20 pounds per tow. Good trawling bottom was found over extensive areas in these depth ranges.



M/V OREGON CRUISE 47 (OCTOBER 16-DECEMBER 7, 1957).

Forty-two shrimp tows were also made in depths of 100 to 400 fathoms. Shrimp (*Solenocera vioscai*) of 20 to 30 count were found in small numbers in 125-135 fathoms off British Guiana and Surinam. Royal-red shrimp (*Hymenopenaeus robustus*) were found in small numbers along with *Penaeopsis megalops* off British Guiana. Catch rates for both species were under 20 pounds per hour.

A very large (4 to 8 count heads-on) scarlet-red shrimp, *Plesiopenaeus edwardsianus*, was caught in 300 to 400 fathoms off Surinam, at rates of 15 to 25 pounds per 3-hour tow.

<sup>1/</sup> IDENTIFICATION TENTATIVE AND MAY BE REVISED.



## Maine

**CANNED SARDINE PACK, 1957:** An official 1957 pack figure of 2,117,151 actual cases of Maine canned sardines was released by the Maine State Department of Agriculture on January 3, 1958. Approximately 2,000,000 cases were of the standard 100-can per case key and keyless packs in oil, mustard, and tomato. The remainder represented ovals, talls, and 12-ounce flats in a variety of sauces and styles of pack.

Bureau of Commercial Fisheries statistical data show that the Maine sardine (including sea herring) pack in 1956 totaled 2,231,333 standard cases (2,226,425 actual cases), somewhat more than was packed in 1957.



There were 37 plants in operation in 1957 at some intervals during the season. The production was split about half and half between the eastern and western sections of the Maine coast.

Washington County, traditionally the sardine capitol of the world, had its best run of fish in five years, and generally the schools were plentiful all along the coast.

The season got off to a slow start in May but picked up rapidly and many plants were closed for some part of the period to eliminate overproduction.

The Maine Sardine Countil's Executive Secretary said that the industry's research and quality control laboratory at Bongor functioned efficiently during the season and contributed towards improving the quality of the pack. He further reported that sardines were not in plentiful supply with the market normal, and that packers' inventories would be at a favorable level at the start of the 1958 sardine season.



### Massachusetts

**BOSTON FISH PIER LANDINGS HIT NEW LOW IN 1957:** The landings of fish and shellfish at the Boston Fish Pier in 1957 reached a new low, according to the Supervisory Market News Reporter of the Boston Fishery Market News Office, Bureau of Commercial Fisheries. Fewer vessels landing fewer trips, the lack of fish on nearby banks, and the competition of foreign imports were believed responsible for the drop in landings.

Landings at the Boston Fish Pier in 1957 totaled only 135.6 million pounds, the lowest since 1924 (131.0 million pounds) when the Fish Pier was still largely dependent on the less productive line-trawlers for supplies. The previous postwar low was 136.5 million pounds in 1955 when the Fish Pier also had a very poor year. The 1956 total was 147.2 million pounds.



TRAWLERS UNLOADING AT THE BOSTON FISH PIER.

Only 2,457 trips of fish were landed at the Boston Fish Pier in 1957, the lowest since 1944 when the fleet was quite small due to the war.

Boston vessels received more money for fish in 1957--\$11.2 million as compared with \$10.5 million in 1956, and \$9.2 million in 1955. But this is still well below the \$14 million average for the postwar years of 1945-54. Prices to the vessels in 1957 averaged higher than the previous two years, but not high enough to compensate for the small catches, vessel owners claimed.

Haddock is the leading species landed at the Boston Fish Pier, and in 1957 landings of this variety amounted to only 93.9 million pounds. In 1956 haddock landings were 106.6 million pounds. Scrod haddock (fish  $1\frac{1}{2}$ - $2\frac{1}{2}$ -pounds) in 1957 exceeded the large haddock (fish over  $2\frac{1}{2}$  pounds) landings.

Cod landings were also light at the Fish Pier in 1957--only 18.5 million pounds. Pollock landings totaled 11.8 million pounds, and flounders and other varieties were landed in small quantities. Whiting, formerly a leading species at Boston, is now landed chiefly at other New England ports.

Mackerel, once landed in volume at the Pier, has become a rare item. It is 10 years since the large fleets of Gloucester purse seiners fished for mackerel and landed their catches at the Fish Pier. The mackerel schools disappeared from their usual migratory routes and after heavy losses the once prosperous fleet of seiners gave up looking for this species.

Facilities on the Fish Pier continued to be reduced in 1957. A few firms closed their doors and others reduced operations. Fewer workers were on hand. At the close of the year the seasonal lay-offs were much more severe than usual.

One of the causes of the decline in the landings at Boston is believed to be foreign competition. Lower-cost Canadian, Iceland, and Norwegian fish has been brought into this country in larger volume almost every year. The large imports continued in 1957. It is difficult to meet this competition because of the difficulty our local vessels have in obtaining capacity or near-capacity loads. Also, catches during most of the year were meager for the effort put forth by the Boston fishing fleet. Bad weather the last quarter of the year did not help either.

Fewer vessels operated at Boston in 1957 as has been the trend for the past decade. Low ex-vessel prices, when compared with continually increasing overhead, has made operating fishing vessels financially unattractive. The exception is when landings are very light, then ex-vessel prices rise and often probably too high, making for an unhealthy condition. The latter was true during the last quarter in 1957.

As 1957 came to a close, leaders in Boston's fishery intensified their efforts to get help from the Federal government. Many claimed this would be their only salvation.



### North Atlantic Fisheries Investigations

HADDOCK TAGGING AND COLLECTIONS CRUISE (T-79 Cruise 19): The November 14-27 cruise of the U. S. Bureau of Commercial Fisheries small research vessel T-79 to the inshore area off Gloucester, Mass., and Mt. Desert, Maine, was unsuccessful. Eight tows made with a 65-foot head-rope otter trawl in search of haddock for tagging and small or 0-group haddock yielded insufficient quantities.

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SURVEY OF HERRING LARVAE DISTRIBUTION AND NONTIDAL-DRIFT PAT-TERN (M/V Albatross III Cruise 106): No large concentrations of herring larvae were found during a December 3-20, 1957, cruise of the U. S. Bureau of Commercial Fisheries research vessel Albatross III to Georges Bank, the Gulf of Maine, and the Bay of Fundy.

During the cruise 2,500 miles of continuous plankton tows were made at the surface and at a 10-meter depth with the Hardy Plankton Recorders. In addition, 245 bathythermograph lowerings, and 50 oblique meter net tows were made, and 125 salinity samples collected. Drift bottles (800) and transponding buoys (5) were released.



## Oregon

COMMERCIAL FISHERIES REGULATIONS REVISED: Recent actions by the Oregon Fish Commission involving commercial fishing regulation changes were summarized by the Acting State Fisheries Director as follows:

Crabs: A limit of three crab pots or rings per fishermen seeking crabs for personal use only is now in effect.

A conditional 15-day extension of the closed season for commercial crabbing in ocean waters of Oregon north of Cascade head has been approved by the Fish Commission, however the extended closure will not take effect until a similar season is provided for in Washington coastal waters. The northern area season opened in 1957 on December 15, as originally scheduled since no change was made in the Washington season.

Petrals Sole: A longer winter closed season on petrale sole fishing has been set and is now in effect. The new closure extends from December 20 to April 15. Trawlers fishing for other species will be permitted to land only 3,000 pounds of incidentally-caught petrale sole on not more than two fishing trips per month during the closed period.

The extended closure was established by the Fish Commission at the request of the state of Washington and Canada who have invoked similar regulations to protect spawning stocks of petrale sole off Vancouver island. Although Oregon druggers do not normally fish the stocks of petrale sole off northern Washington and British Columbia in the winter months, the Oregon closure was considered necessary to prevent sizable deliveries in Oregon of petrale sole caught from the depleted stocks in the northern area.

Shrimp: the "Gulf type" shrimp trawl is now recognized by the Fish Commission as lawful shrimp fishing gear in Oregon waters. Previous regulations permitted use of only the beam trawl for shrimp fishing in Oregon. The Commission liberalized the shrimp gear designation on the basis of preliminary investigations by staff biologists that indicated the "Gulf type" trawl does not appear to be seriously harmful to young food fish species. The Commission has stated, however, that additional restriction of the shrimp fishery may be necessary at a future date for the protection of the shrimp and other food fish species.

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LANDINGS OF FISH AND SHELLFISH HIGHER FOR 12 MONTHS ENDED MARCH 31, 1957: Oregon landings of commercially-caught fish and shellfish during the 1956/57 license year (April 1, 1956-March 31, 1957) were the highest of the past nine years, according to figures released by the Oregon Fish Commission on December 23, 1957. A total of 60,456,000 pounds of fisheries items was reported by Oregon fish buyers during the period, an increase of about 14 million pounds over the quantity reported for the previous license year.

The greatest increase was in deliveries of Dungeness crabs. Deliveries of bottom fish (used for mink feed), albacore tuna, and troll-caught salmon were also higher in 1956/57.

The net increase in 1956/57 (April 1-March 31) landings of marine fish, including albacore, crabs, and clams amounted to 13 million pounds. Reported deliveries of salmon (both ocean-troll and river-caught fish), shad, sturgeon, smelt, and striped bass showed a net increase of one million pounds over the 1955/56 landings.

The highest landings of fisheries products in Oregon prior to 1956/57 occurred in 1948 when total landings exceeded 74 million pounds.

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**REVISION OF SHRIMP FISHING REGULATIONS UNDER STUDY:** With the imminent development of a new semiballoon trawl-net shrimp fishery off the Oregon coast, three biologists of the Oregon Fish Commission have recently been conducting tests with a Gulf-type semiballoon shrimp trawl to determine what kinds of fish are caught by the net in addition to shrimp.

The biologists are particularly interested to learn the percentages of juvenile English, dover, and petrale soles that come up with shrimp catches during a normal shrimp fishing trip. Another purpose of the experimental fishing is to see if a semiballoon trawl will catch adequate samples of tiny dover sole needed for age and growth studies of this commercially-important species.

Present regulations prohibit the use of anything but a beam trawl (another type of shrimp net used in California and Alaska) for shrimp fishing in Oregon waters. But the net that has apparently been best for shrimp fishing off the Washington Coast is the Gulf-type trawl.

The Commission research staff at Astoria doing the trial fishing reports that initial testing of the Gulf-type trawl has indicated many different species of fish intermingled with good catches of shrimp. The best shrimp catches of 1,600-1,800 pounds an hour of fishing were made 30-35 miles offshore at depths of 70-80 fathoms between the Astoria lightship and Tillamook rock.

Hake, skates, turbot, and two other kinds of soles were the most prominent fish species taken in the net with the shrimp. The Gulf trawl also picked up good samples of juvenile dover sole, which the biologists were particularly interested in collecting. The test fishing was done aboard the Roseann Hess.

Success of the Gulf-type trawl off the Washington coast has stimulated prospective Oregon shrimp fishermen to ask the Commission to alter the beam trawl-only restriction and make the Gulf shrimp trawl legal gear in Oregon waters. Action on the request has been delayed until the Commission's research staff can evaluate possible effect on juvenile sole if use of the Gulf trawl is permitted.

A hearing to consider the advisability of changing the shrimp gear regulations was held by the Commission on November 14, 1957.



### Pacific Oceanic Fishery Investigations

**LARGEST INTRODUCTION OF MARQUESAN SARDINES TO HAWAIIAN WATERS:** The possibility of large-scale spawning of Marquesan sardines in Hawaiian waters was furthered recently by the liberation of 31,000 live sardines in shallow water off Ewa, Oahu, on December 14, 1957. They were released from the Pacific Oceanic Fishery Investigations' research vessel Charles H. Gilbert following her return from an extensive tuna survey in the Marquesas Islands. Many of the female sardines brought to Hawaii by the vessel were ready for spawning.

The December 14 planting was the largest in the history of the program for introduction of Marquesan sardines into Hawaiian waters. Since January 1955 more than 53,000 sardines have been transported live from the Marquesas and released here. If the sardines can be successfully established in Hawaiian waters, they



could play a large part in relieving the shortage of live bait for catching skipjack tuna (aku), which has bothered local fishermen for years. The recapture of sardines around Oahu on six occasions during 1956 and 1957 has indicated at least some success in the attempted introduction.

Since evaluation of the results of this attempt to help the Hawaiian fishing industry depends on reports from fishermen, all persons who see or catch any unusual sardinelike fish in Hawaiian waters are requested to report them to the Territory's Division of Fish and Game or to the U. S. Fish and Wildlife Service. It is especially important that the fishery scientists be given an opportunity to examine any such fish in order to identify them positively, see what they are finding to eat in local waters, and check for signs of spawning activity.

\* \* \* \* \*

STOMACH CONTENTS OF SKIPJACK TUNA STUDIED FOR CLUES TO CATCH-ABILITY: Laboratory analysis of the stomachs of skipjack tuna, to determine whether or not the diet of the fish is related to the catchability of the skipjack schools has shown some promise, scientists of the U. S. Bureau of Commercial Fisheries Pacific Oceanic Fishery Investigations reveal.

It appears that two things characterize a "good biting school:" (1) the fish has recently been fed, that is, the stomach contains relatively digested natural food; and (2) the stomach is relatively empty, that is to say, skipjack respond well to chum if they are in a feeding mood as evidenced by their having recently eaten and providing that they have not yet secured enough food to satisfy them. Conversely, fish that have not partaken any natural food for a long period, as evidenced by the advanced stage of digestion of their stomach contents, or fish that have recently gorged themselves, do not respond well to the chum. Other factors investigated, such as the kind of food consumed, time of day, etc., apparently bore no relation to the fishing quality of the skipjack schools.

Whether or not a so-called "feeding mood" as evidenced by the presence of freshly-eaten natural food in the stomachs was brought about by some internal mechanism or was precipitated by the presence of natural forage is not known. Though this knowledge may not be of direct benefit to commercial fishermen, indirect benefits are obvious. For instance, in many areas scientists are forced to rely on live-bait catches as an index of tuna abundance. We try to relate these catches to oceanographic and biological factors in the ocean on the assumption that the population of tuna bears a direct relationship to the amount of natural food. If the recent study is correct, good live-bait tuna fishing might not be associated with maximum abundance of food, but rather with some intermediate condition in which tuna are relatively abundant and food is abundant enough to support the tuna, but not so abundant that they are able to gorge themselves with ease.

\* \* \* \* \*

INTERNATIONAL GEOPHYSICAL YEAR STATIONS OCCUPIED AND OCEANOGRAPHIC AND BIOLOGICAL DATA COLLECTED IN MARSHALL ISLANDS AREA (M/V Hugh M. Smith Cruise 41): Two International Geophysical Year (IGY) stations were occupied September 16-17 and October 29-30 in the vicinity of Oahu Island, Hawaii, and a physical and biological survey in the Marshall Islands area was conducted September 28-October 19 by the research vessel Hugh M. Smith.

This vessel of the Pacific Oceanic Fishery Investigations of the U. S. Bureau of Commercial Fisheries made a total 149 bathythermograph casts. Sixteen oceanographic stations were occupied in the offshore area of Eniwetok Atoll and two during each of the IGY stations for a total of 20 for the entire cruise.

Of 21 half-hour open net zooplankton tows completed, 13 were in the offshore area at Eniwetok. Three of the Eniwetok tows were for surface larval tuna electrophoretic and serological studies. Larval tuna were preserved by freezing in plastic bags.

The cruise also included on Eniwetok Atoll a detailed bathymetric survey; the tracking of parachute drogues in the offshore area; seismological stations; one offshore night-light fishing station and 3 stations within the lagoon (collections of fish were generally very poor). Surface trolling was done with 2 and 3 lines during daylight hours on the run between Honolulu and the Marshall Islands and return. On the way to Eniwetok several lures were lost to large fish, apparently yellowfin tuna, but no fish were landed on board during the entire cruise as a result of trolling.

The regular bridge watch for tuna schools, bird flocks, aquatic mammals was maintained between the Marshall Islands and Hawaiian Islands and at Eniwetok when conditions permitted. The following schools were recorded: In Hawaiian waters, 1 skipjack and 5 unidentified tuna; in the Marshall Islands area, 1 skipjack, 1 yellowfin, 1 little tuna, and 3 unidentified tuna; and in the open oceans, 1 yellowfin and 1 skipjack.

\* \* \* \* \*

OCEANOGRAPHIC AND BIOLOGICAL DATA COLLECTED (M/V Hugh M. Smith Cruise 42): From November 26-27 the U. S. Bureau of Commercial Fisheries Pacific Oceanographic Fishery Investigations research vessel Hugh M. Smith occupied International Geophysical Year Station 5. The station located at  $21^{\circ}10.3'N$ . latitude and  $158^{\circ}19.0'W$ . longitude was occupied at highest high and lowest low tide levels.

Bathythermograph (BT) casts were made each hour between station times, plus biological, and other observations. Two shallow hydrographic casts from 0-500 meters and one deep cast from 600-2,500 meters were made at the station. Four 0-60 meter oblique and two Clarke-Bumpus plankton tows were made on the station. A carbon-14 sample was taken and a Secchi disk lowering made.

\* \* \* \* \*

WINTER ABUNDANCE AND DISTRIBUTION OF SKIPJACK TUNA IN HAWAIIAN WATERS SURVEYED (John R. Manning Cruise 38):

A month-long survey of the winter abundance and distribution of skipjack tuna (aku) in Hawaiian waters was completed by the research vessel John R. Manning of the Bureau of Commercial Fisheries Pacific Oceanic Fishery Investigations. The vessel returned to its base at Honolulu on December 4, 1957.

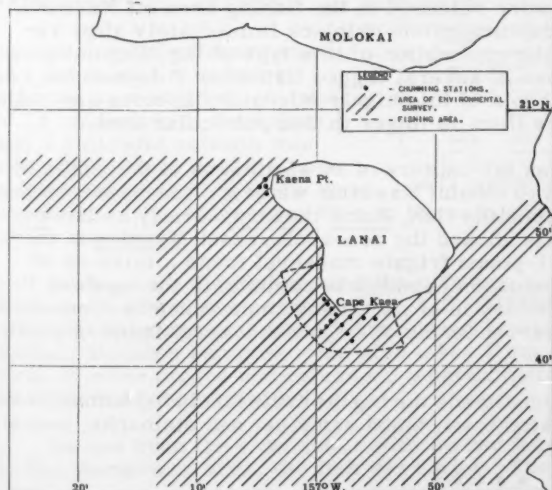


CHART 1 - JOHN R. MANNING, CRUISE 38 (11/5-12/4/57).

This cruise was part of a continuing program to monitor seasonal and long-term fluctuations in the skipjack population to the Hawaiian area and to gather information on water temperature, salinity, currents, plankton, and other environmental factors which may influence such fluctuations. As on earlier cruises of the series, concentrated observations were carried out in a small area off

leeward Lanai, where skipjack, for reasons as yet unknown, tend to congregate and remain for considerable periods of time. It is hoped that the studies of this skipjack concourse may eventually provide clues to the explanation of the larger migratory movements of this commercially-important fish.

Skipjack were found to be somewhat more abundant in Hawaiian waters than during the last previous survey, made during September and October 1957, although still generally scarce, as expected during the winter off-season.

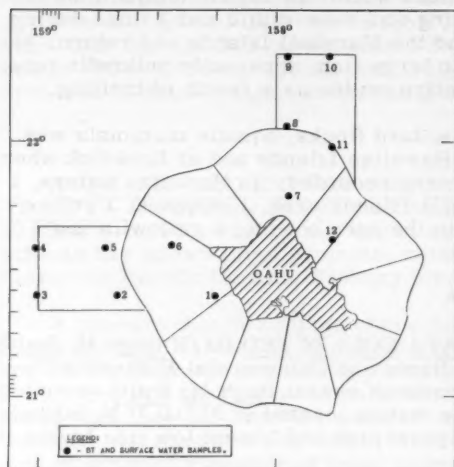


CHART 2 - JOHN R. MANNING, CRUISE 38 (NOVEMBER 5-DECEMBER 4, 1957).

Off Cape Kaea, Lanai, the series of chumming stations was occupied twice, once in the morning and the other in the afternoon. At each station the vessel made a tight circle at a reduced speed and chumming was done for 10 minutes. No skipjack were raised. Little tunny responded to the chum at three stations during the series conducted in the morning.

A series of four chumming stations was occupied just off Kaena Point, Lanai (northwestern point of Lanai) to check on a reported skipjack concourse occurring there during this time of the year. A school of little tuna responded to chumming at one of the stations.

Though no skipjack were taken at the blind chumming stations, a total of 8 skipjack, 7 little tuna, and 1 frigate mackerel schools were fished in the vicinity of the concourse with varying degrees of intensity. In the case of little tuna, fishing was generally terminated as soon as the identity of the fish was determined. The frigate mackerel school was fished only because so little bait remained that there was no point in conserving it for further chumming.

Marking of captured fish with plastic dart tags was continued, and 548 skipjack and 15 little tuna (*Euthynnus yaito*) were released in the fishing area off Kaema Point, Lanai, during the cruise. Recapture of one skipjack immediately after release gave additional evidence that the application of this type of tag does not greatly distress the fish, and the recapture of several tagged fish after 2 days in the concourse off Lanai showed that the schools of this highly migratory species are still finding some conditions which induce them to linger in this particular spot.

Of special scientific interest was the capture of 21 specimens of a species of frigate mackerel hitherto not known to inhabit Hawaiian waters. It had been believed that only one species of this small tunalike fish, *Auxis thazard*, locally called *keokeo*, occurred here, but the scientists aboard the research vessel *Manning* in examining the catch from a school of 1-pound frigate mackerel found a mixture of this species with another, *Auxis tapeinosoma*, which is common in the western Pacific and the East Indies. This discovery is of particular importance in connection with the identification of the small larval forms of frigate mackerel found in plankton collections in Hawaiian waters.

Other observations and collections made during the cruise included bathythermograph casts; salinity samples; plankton tows; blood samples; and stomachs, ovaries, and caudal vertebrae.

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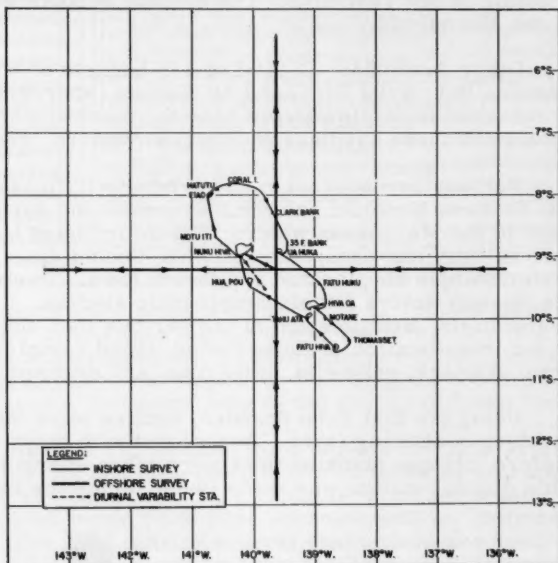
**MARQUESAS ISLANDS AREA SURVEYED FOR SURFACE TUNA SCHOOLS AND LIVE BAIT (M/V Charles H. Gilbert Cruise 35):** Marquesas Tuna Schools: The location of surface schools of tuna and the collection of information on live bait in the Marquesas, and visual surveys for tuna schools in the Tuamotu Islands area were the principal objectives of the October 2-December 14, 1957, cruise of the Bureau of Commercial Fisheries Pacific Oceanic Fishery Investigations research vessel Charles H. Gilbert.

Type	Cruise 32			Cruise 35		
	Jan. 25-31, 1957	Feb. 23-Mar. 1, 1957	Total	Oct. 14-21 1957	Nov. 24-30 1957	Total
	(Number of Schools Sighted) . . . . .					
Skipjack . . .	40	21	61	5	8	13
Yellowfin. . .	4	7	11	3	1	4
Unidentified. .	32	61	93	25	31	56
Total . . .	76	89	165	33	40	73

Fewer than half the number of surface tuna schools were sighted during this cruise in the Marquesas Islands area than during similar surveys in January-March 1957. A summary of the schools sighted during the two surveys appears in table above.

Three standard surveys were made (see chart). Two of them were designated as "inshore," near the Marquesas Islands, and one was designated as "offshore." The two inshore surveys followed the same pattern as those conducted during a previous summer and winter cruise in the Marquesan area. The offshore survey was conducted for the first time during this cruise. It is planned that both the inshore and the offshore surveys will be repeated at frequent intervals until June 1958.

During the offshore survey, comparatively fewer schools were sighted. A total of 11 unidentified, 6 skipjack, and 1 yellowfin schools was recorded. More surface tuna schools were sighted to the west and north of the Marquesas than to the east and south during the period of the offshore survey.



THREE SURVEYS OF TUNA SCHOOLS IN THE MARQUESAS ISLANDS AREA DURING CHARLES H. GILBERT CRUISE 35.

During both the inshore and the offshore surveys, the first 25 fish taken aboard from each school were retained for determination of size frequency and sex. Stomach and ovary samples were taken from 5 females. During the latter half of the cruise, stomach samples were also taken from 5 males. All fish caught after the first 25 were tagged and released. Approximately 1,350 fish were tagged with the POFI dart tag and released.

As has been the experience with the surface schools during the previous cruises in the Marquesan area, the fish were wild. The variation in the biting quality is



reflected in the fact that the catches from a single school ranged from 4 to a maximum of 563. The mean was 72. Most of the skipjack caught were small, less than 15 pounds.

Apparent Abundance and Biology of Live-Bait in the Marquesas: Surveys were conducted in 6 bays of the Marquesas for the Marquesan sardine (*Harengula vittata*). Sardines were abundant in Taiohae, Nuku Hiva. Eighty buckets of bait were caught in four sets prior to the first inshore survey and on another occasion 58 buckets were taken in two sets. Limited quantities of bait were observed in Taa Huku Bay, Hiva Oa. No sardines were found in 4 bays on the north side of Tahu Ata Island.

Experience has shown that mortality of these bait fish can be reduced by preventing crowding during the brailing operation. Bait was carried during the inshore and offshore surveys for periods of 6 to 7 days with a mortality of approximately 15 percent, most of which occurred during the first day.

The size frequency, sex, and gonad development were recorded from 25 sardines at each baiting locality.

Visual surveys in the Tuamotu Islands Area: Four days were spent fishing and scouting in the Tuamotus. The surface schools were somewhat more abundant than in the Marquesas.

Other Activities: A total of 100 buckets of Marquesan sardines were caught in Taiohae Bay, Nuku Hiva, and 86 buckets, approximately 31,000 fish, were subsequently released in shallow water near the southwestern coast of Oahu. This, the fourth release of these sardines in Hawaiian waters, was the largest to date.

Various oceanographic and productivity measurements were made during the run between Honolulu and the Marquesas and during the inshore and offshore surveys in the Marquesan waters. These included bathythermograph lowerings, surface salinity and phosphate samples, Secchi disc, Forel observations, and 0-140 meter oblique zooplankton and larval tows. Twelve surface tows were made in the Marquesan waters for electrophoretic studies. It is hoped that these studies will assist in the identification of the various tuna and tunalike larvae. To further assist in the identification of these fishes, blood samples for serological tests were taken from skipjack, yellowfin, little tuna, and dogtooth tuna.

Using the Edo Echo Sounder, studies were made of the variations in depth of the deep scattering layer. Associated with these observations, duplicate, 0-140 meters, oblique plankton tows were taken every 3 hours over a 24-hour period. This diurnal station was made twice during the cruise.



### Quality

TRAWLER AND WHOLESALER SCORE SHEETS FOR SELF-EVALUATION OF FRESH FISH QUALITY IMPROVEMENT: Rules and standard procedures for New England trawlers and primary wholesalers for quality improvement of fresh fish were introduced in January 1957. For use on a voluntary basis, the procedures were developed by the Technology Division of the National Fisheries Institute under the terms of its contract with the U. S. Bureau of Commercial Fisheries. The contract is financed by funds provided by the Saltonstall-Kennedy Act of 1954.

The quality guidelines for primary wholesalers were printed on an 8½" x 11" white poster for posting in all New England primary wholesaler establishments. In order to evaluate the results of the initial distribution and posting of the quality



rules and procedures, a "Score Sheet for Self Evaluation--New England Primary Wholesalers" (#1) has been developed for New England primary wholesalers to check themselves on the many factors that contribute to the quality of fresh fish.

Score Sheet #1  
December 2, 1957

**SCORE SHEET FOR SELF EVALUATION -- NEW ENGLAND PRIMARY WHOLESALERS**

(A supplement to the "Rules and Standard Procedures" developed and accepted by the Industry -- with the assistance of the Bureau of Commercial Fisheries and the U.S.I. Technology Division)

**Instructions:** Evaluate your operation with respect to each of following 20 statements. Assign score points according to following schedule:

Always 5	Often 3	Seldom 1
Usually 4	Occasionally 2	Never 0

The sum of the assigned score points will indicate how well your operation is following the accepted "Rules and Standard Procedures". A score of 100 is possible.

	Circle one
1. Conveyances (cars, boxes, trucks, etc.) are in a clean and sanitary condition before receiving fish.	5-4-3-2-1-0
2. Conveyances (cars, boxes, trucks, etc.) are loaded correctly. (That is, not overloaded)	5-4-3-2-1-0
3. Covers are provided for use on all conveyances.	5-4-3-2-1-0
4. Conveyances are covered as soon as they are loaded regardless of location.	5-4-3-2-1-0
5. Fish stored in conveyances, or stored in areas awaiting handling, are iced at all times.	5-4-3-2-1-0
6. Fish awaiting handling are inspected periodically and more ice is added when needed.	5-4-3-2-1-0
7. Fresh fish are handled without using forks or hooks.	5-4-3-2-1-0
8. All containers used for shipment of fresh fish are clean and new.	5-4-3-2-1-0
9. Returned packages (barrels, boxes, etc.) are refused for credit or re-use.	5-4-3-2-1-0
10. Fish (fillets, etc.) awaiting handling (to and at freezer) are packed in a manner to avoid pressure on the fish below.	5-4-3-2-1-0
11. Fillets, etc. in a fresh condition, being transferred from one place to another are carried in specially provided containers.	5-4-3-2-1-0
12. Containers provided for the transferring of fresh fillets are covered and iced regardless of destination.	5-4-3-2-1-0
13. All carts, boxes and conveyances are washed thoroughly, immediately after they become empty of fish.	5-4-3-2-1-0
14. Plant and equipment are regularly and frequently washed down when plant is in operation.	5-4-3-2-1-0
15. Responsibility for plant cleanliness is specifically assigned to one person.	5-4-3-2-1-0
16. Exterminators are regularly employed for the control of rodents, vermin, flies, etc.	5-4-3-2-1-0
17. All fresh fish operations (filleting, cutting, etc.) are performed within doors with proper facilities available.	5-4-3-2-1-0
18. Clothing of all personnel is in a clean condition consistent with the requirements demanded in the handling of food.	5-4-3-2-1-0
19. Smoking is not allowed in the filleting and wrapping rooms -- on lines, tables or benches used for processing.	5-4-3-2-1-0
20. All waste, refuse, trimmings, etc. are disposed of at the end of the day and refuse containers are washed and sanitized.	5-4-3-2-1-0
Total Score	

Score Sheet #2  
December 2, 1957

**SCORE SHEET FOR SELF EVALUATION -- NEW ENGLAND TRAWLERS**

(A supplement to the "Rules and Standard Procedures" developed and accepted by the Industry -- with the assistance of the Bureau of Commercial Fisheries and the U.S.I. Technology Division)

**Instructions:** Evaluate your operation with respect to each of following 20 statements. Assign score points according to following schedule:

Always 5	Often 3	Seldom 1
Usually 4	Occasionally 2	Never 0

The sum of the assigned score points will indicate how well your operation is following the accepted "Rules and Standard Procedures". A score of 100 is possible.

	Circle one
1. Fish are gutted thoroughly, leaving no part of the gut (livers, etc.) to start spoilage.	5-4-3-2-1-0
2. All stowable fish (over 2 lbs.) are gilled, winter and summer.	5-4-3-2-1-0
3. Gutted fish are washed thoroughly.	5-4-3-2-1-0
4. Water in washing box is changed frequently.	5-4-3-2-1-0
5. Fish are put down out of the venther quickly.	5-4-3-2-1-0
6. Fish coming out of the hold are sorted with care to put down on number of dock culls.	5-4-3-2-1-0
7. Ice bed in pen is at least six (6") thick.	5-4-3-2-1-0
8. Jarred edges in crushed ice are pounded out and made smooth. (Culls fish carry the weight)	5-4-3-2-1-0
9. At least three inches (3") of space is left between fish, pen boards and hull.	5-4-3-2-1-0
10. All layers of fish in pens are gauged to the size of the variety so that all fish get the benefit of ice.	5-4-3-2-1-0
11. Fish are shelved in order to relieve jamming pressure on the bottom fish.	5-4-3-2-1-0
12. Plenty of ice is used at all times. (This protects against breakdowns, bad weather and accidents or sickness)	5-4-3-2-1-0
13. The hold and pen boards are dried out and painted thoroughly at least once a year.	5-4-3-2-1-0
14. The hold is washed completely after the discharge of each trip and a bactericide is sprayed or hosed on the cleaned surfaces.	5-4-3-2-1-0
15. Pen boards are washed and scrubbed immediately after they come out of the hold.	5-4-3-2-1-0
16. Horn or bent up pen boards are replaced with new ones.	5-4-3-2-1-0
17. Working tools, which come in contact with fish, are kept clean and free of rust.	5-4-3-2-1-0
18. Culls are handled quickly when discharging trip.	5-4-3-2-1-0
19. Culls are not thrown on deck but placed immediately in an iced container on the "hook."	5-4-3-2-1-0
20. Facilities for personal cleanliness are provided and used.	5-4-3-2-1-0
Total Score	

The quality guidelines for trawlers were printed on an 8½" x 11" yellow poster for posting on all trawlers. In order to evaluate the results of the initial distribution and posting of the quality rules and procedures, a "Score Sheet for Self Evaluation--New England Trawlers" (#2) has been developed for New England trawlers to check themselves on the many factors that contribute to the quality of fresh fish.

Although the score sheets are designed to be used for a private and self-evaluation program, the actual written results can be tremendously valuable as a basis for discussions with crews, mates, sea captains, shore captains, plant personnel, managers, etc. Also, an excellent idea would be to have someone with an "outside eye" make one of the evaluations. For best results several evaluations are desirable.

NOTE: SEE COMMERCIAL FISHERIES REVIEW, FEBRUARY 1957, P. 30.



## South Atlantic Exploratory Fishery Program

EQUIPMENT FOR PRODUCING FILMS OF SHRIMP TRAWLS IN OPERATION TESTED (M/V George M. Bowers Cruise 10): The testing of equipment and working details with reference to the production of films of shrimp trawls under tow were carried out by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel George M. Bowers from November 21-December 4, 1957.

An area west of Eleuthera Island in the Bahama Islands (approximately  $76^{\circ}30'$  W. latitude,  $25^{\circ}10'$  N. longitude) was selected for this work. Features of this area are: (1) excellent water clarity, (2) a clean and even bottom, and (3) a uniform depth of  $4\frac{1}{2}$ -5 fathoms extending over many miles.

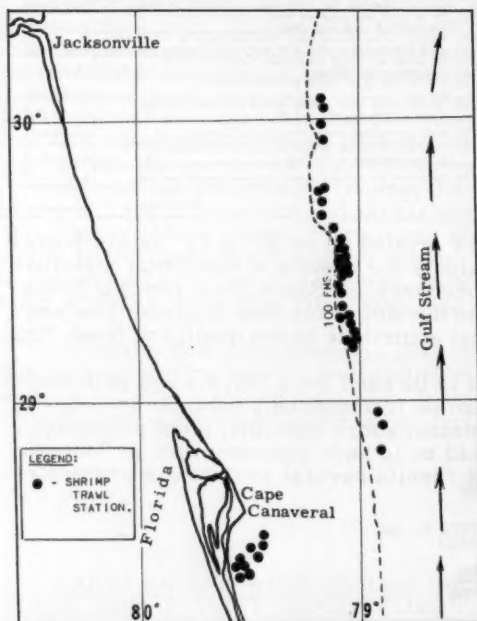
Experience was gained in the coordination of operations with the shrimp trawl, surface skiff, and diving sled under tow. Several rolls of color and black-and-white film were made of the trawl while being towed.

The vessel shakedown was generally successful, but the failure of the new radar set prevented accomplishment of one of the objectives, which was to use this gear to aid in making determinations of the vessel's speeds with and without the trawls.

The experience of this cruise indicates that weather conditions in this area would be more favorable for further photographic work during late spring and summer.

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**EXPLORATORY ROYAL-RED SHRIMP FISHING CRUISE OFF FLORIDA EAST COAST COMPLETED (M/V Silver Bay Cruise 5):** A three-week exploratory royal-red shrimp fishing cruise along the Florida east coast by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Silver Bay was completed on December 8, 1957. The cruise was planned to obtain additional seasonal information on the catch potential for royal-red shrimp between St. Augustine and Cape Canaveral and also to test an experimental 96-foot balloon trawl equipped with a Vigneron-Dahl rig with bracket doors.



M/V SILVER BAY CRUISE 5 (NOV. 14-DEC. 8, 1957)

Strong northerly winds and unusually strong currents continually hampered the offshore operations during the trip. Catches of shrimp varied greatly and no satisfactory gear comparisons could be made. Both 40- and 65-foot flat trawls were used in exploratory dragging which revealed low concentrations over most of the area fished. The best catch in 26 exploratory drags was 245 pounds of 20-25 count (heads-on) royal-red shrimp, averaging 25-60 pounds a tow.

Best fishing was found in the vicinity of  $29^{\circ}26'$  N. latitude,  $80^{\circ}06'$  W. longitude, where in an 18-hour period one drag with the 96-foot net yielded 355 pounds of shrimp and four drags with the 40-foot

net yielded 590 pounds of 15-25 count royal-red shrimp.

Limited shallow water trawling was conducted south of Cape Canaveral on white shrimp. Twin trawling, using two 40-foot flat trawls, yielded combined hourly catches of about 30 pounds of heads-on white shrimp. Hourly catches of the 96-foot balloon trawl were 50 to 100 pounds of shrimp.

Heavy concentrations of subsurface fish schools were observed on depth-recorder tracings south of Canaveral Shoal. Sampling with a high-opening fish trawl indicated that these schools were made up of Harengula (sardinelike fish) and Opis-thonema (thread herring).



### Sponges

**RESEARCH SHOWS HOW TO REVITALIZE AMERICA'S RESOURCE:** The American natural sponge resource can be placed on a high sustained-yield basis if proper management and harvesting practices are put into effect, the Assistant Secretary of the Interior said on December 11, 1957.

This statement was based upon a study just completed by the University of Miami Marine Laboratory under contract to the United States Fish and Wildlife Service, which shows that the high sustained-yield goal can be reached (1) if harvesting is restricted to sponges not less than six inches in diameter; (2) if a suggested program of transplanting mature sponges during the spawning period is conducted; and (3) if certain other changes in management and harvesting techniques are inaugurated.

The report shows that natural sponge production in the sponge areas off the Gulf Coast of Florida has never regained or even approached its proportions prior to the disease outbreak in 1938. At the time that the natural sponge resource was struggling with the effects of that scourge, the manufacture of synthetic sponges increased. With the outbreak passed, the problem facing the natural sponge industry became one of not only revitalizing the sponge beds of Florida's offshore waters, but also producing sponges at prices which are competitive with synthetic sponges.

The report further declares that because the natural sponge (which is really an animal skeleton) has certain qualities which have not yet been built into the synthetic competitor, any effort which would increase production and insure a steady supply would be welcomed by those who use sponges. In the days when the natural article had the field to itself, one-fourth of the output went to homes and to amateur users, one-fourth went to the pottery industry, and half went to professional painters, decorators, and cleaners.

The report says that good management practice usually dictates that no desirable species be harvested until it has had a chance to reproduce and sustain the yield. A commercial sponge less than six inches in diameter is immature, has had no opportunity to reproduce, and therefore should not be taken.

Between 15 and 25 percent of the sponges currently harvested are less than six inches in diameter, and for a year or two the harvest would be down that much in volume. However, since these smaller sponges bring a lower price the decrease in value would be only 5 to 10 percent. Increased yield after the first year or two would more than make up for this loss, the study indicates. It further shows that there is possibility of a slight increase in the supply on the sponge beds and that this increase in over-all supply would offset some of the loss incurred by not harvesting the smaller sponges.

According to the research, the sponge area could be practically doubled in 10 years under a proper management program. The wool sponge, which constitutes about 90 percent of the commercial harvest, will reach the six-inch size in about three and a half years.

The natural sponge from American sources became commercially important about 1849. Between 1917 and 1938 production of the wool sponge averaged about 350,000 pounds a year, with a peak production of 468,000 pounds in 1936. Production dropped steadily until 1951 when it reached 11,000 pounds. At present it is about 30,000 pounds.

While the wool sponge is by far most important commercially, other sponges which have market value are the yellow, anclote yellow, key grass, gulf grass, finger, and glove.

The sponge study was begun in June 1955 and financed with funds provided by the Saltonstall-Kennedy Act of 1954.



### United States Fishing Fleet<sup>1/</sup> Additions

SEPTEMBER 1957: During September 1957, 48 vessels of 5 net tons and over were issued first documents as fishing craft--14 more than in September 1956. The

Table 1 - U. S. Vessels Issued First Documents as Fishing Craft, by Areas, September 1957 with Comparisons

Area	Sept.		Jan.-Sept.		Total
	1957	1956	2/1957	1956	1956
	(Number)				
New England. . . .	2	1	17	13	15
Middle Atlantic. . .	2	-	21	21	26
Chesapeake. . . . .	15	12	82	87	138
South Atlantic. . . .	7	12	91	92	119
Gulf. . . . .	14	6	117	83	100
Pacific. . . . .	2	1	89	68	76
Great Lakes. . . . .	-	-	5	2	6
Alaska. . . . .	6	2	46	39	40
Hawaii. . . . .	-	-	-	1	1
Puerto Rico. . . . .	-	-	1	-	-
Total. . . . .	48	34	469	406	521

NOTE: VESSELS ASSIGNED TO THE VARIOUS SECTIONS ON THE BASIS OF THEIR HOME PORTS.  
2/REVISED.

<sup>1/</sup> INCLUDES BOTH COMMERCIAL AND SPORT FISHING CRAFT.

Table 2 - U. S. Vessels Issued First Documents as Fishing Craft, by Tonnage, Sept. 1957

Net Tons	Number
5 to 9	17
10 to 19	10
20 to 29	9
30 to 39	5
40 to 49	3
50 to 59	2
170 to 179	2
Total	48

Chesapeake area led with 15 vessels. The Gulf area was second with 14 vessels, followed by the South Atlantic with 7, Alaska 6, and New England, the Middle Atlantic, and Pacific areas with 2 each.



### United States Fishery Landings Down 7 Percent First 10 Months of 1957

The landings of fish and shellfish in the United States and Alaska during the first ten months of 1957 were down sharply as compared with the same period in 1956. Fisheries which yielded about 3.7 billion pounds during the first ten months of 1957 produced 4.0 billion pounds during the same period the previous year.

Menhaden showed the greatest decline, with a catch of 1.6 billion pounds during the first ten months of 1957 as compared with 1.9 billion pounds for the same period in 1956. In New England the catch of ocean perch was down nearly 21 million pounds and haddock 9 million pounds. On the West Coast, the California catch of Pacific sardines declined 23 million pounds;

tuna declined 25 million pounds; and in Alaska the landings of salmon were down about 50 million pounds.

Increased landings during the first ten months of 1957 were reported for Maine herring (up 23 million pounds) and Alaska herring (up nearly 11 million pounds, with the season over). Whiting in New England increased 35 million pounds over 1956; and in Massachusetts, industrial fish (excluding menhaden) increased over 54 million pounds.

In 1956 United States and Alaska fishermen landed a record catch of 5.2 billion pounds. From information reported to date, it appears that the 1957 catch will fall from 300 to 400 million pounds short of that total.



United States Catch of Fishery Products, Various Periods, 1957 and 1956 1/				
Item	Period	1957	1956	Total 12 Mos. 1956
..... (1,000 Lbs.) .....				
Maine	9 mos.	238,414	220,087	277,822
Massachusetts:				
Boston	9 mos.	118,783	127,444	147,402
Gloucester	9 "	230,800	229,185	252,038
New Bedford	9 "	87,875	77,392	87,965
Provincetown	9 "	22,603	20,449	21,151
Total Mass.		460,061	454,470	508,556
Rhode Island 2/	10 mos.	108,712	108,996	129,406
New York 2/	10 "	33,944	30,358	38,268
New Jersey 2/	10 "	41,160	41,571	46,097
North Carolina 2/	10 "	60,195	45,893	49,009
Georgia	10 "	15,991	14,334	16,711
Florida 2/	9 "	95,214	95,190	142,493
Alabama	9 "	9,332	9,297	12,320
Mississippi 2/	9 "	16,624	17,324	22,573
Texas 2/	9 "	55,490	41,334	61,993
Ohio (Mar.-Oct.)	10 "	21,749	24,044	24,928
Oregon	9 "	49,855	51,512	59,256
California:				
Sardine, Pacific	11 mos.	34,768	58,026	69,554
Certain species 3/	9 "	384,822	388,730	604,218
Other	7 "	60,431	54,241	86,192
Total Calif.		480,021	500,997	759,964
Rhode Island, Middle Atlantic, Chesapeake, South Atlantic, and Gulf States (menhaden)	10 mos.	1,547,733	1,835,780	2,010,393
Louisiana, shrimp (heads-on)	8 mos.	20,384	27,445	50,541
Washington:				
Halibut 4/	10 mos.	15,430	15,874	16,604
Otter trawl fishery	11 "	39,679	44,965	49,530
Salmon	11 "	42,771	27,184	28,700
Alaska:				
Halibut 1/	10 mos.	20,733	24,211	33,076
Herring (season over)	11 "	114,664	103,759	103,759
Salmon (season over)	11 "	220,000	269,898	269,898
Total of all above items		3,708,156	4,004,523	4,711,897
Other (not included)		5/	5/	488,103
Grand Total		5/	5/	5,200,000

1/ Preliminary.

2/ Excluding menhaden.

3/ Includes the catch of: anchovies, jack and Pacific mackerel, tuna and tunalike fishes, and squid.

4/ Dressed weight.

5/ Data not available.

United States Catch of Certain Species, Various Periods, 1957 and 1956 1/				
Item	Period	1957	1956	Total 12 Mos. 1956
..... (1,000 Lbs.) .....				
Anchovies, California	9 mos.	42,074	43,928	54,282
Cod:				
Maine	9 mos.	1,780	2,151	2,361
Boston	10 "	16,124	16,269	17,518
Gloucester	10 "	1,442	1,229	1,361
Total cod		19,346	19,649	21,240
Haddock:				
Maine	9 mos.	3,344	3,601	4,340
Boston	10 "	85,808	93,732	106,662
Gloucester	10 "	6,494	7,717	8,774
Total haddock		95,646	105,050	119,776
Halibut: 2/				
Washington	10 mos.	15,430	15,874	16,604
Alaska	10 "	20,733	24,211	33,076
Total halibut		36,163	40,085	49,680
Herrings:				
Maine	9 mos.	129,194	105,789	140,472
Alaska (season over)	10 "	114,664	103,759	103,759
Industrial fish:				
Mass. 3/	10 mos.	99,854	45,665	124,429
Mackerel, California:				
Jack	9 mos.	65,222	45,274	76,784
Pacific	9 "	26,166	22,994	47,766
Menhaden	10 mos.	1,569,396	1,901,975	2,076,588
Ocean perch:				
Maine	9 mos.	50,473	54,852	64,967
Boston	10 "	3,275	2,424	2,839
Gloucester	10 "	57,250	74,621	83,303
Total ocean perch		110,998	131,897	151,109
Otter trawl fishery Wash.	11 mos.	39,679	44,965	49,530
Salmon:				
Washington	11 mos.	42,771	27,184	28,700
Alaska (season over)	11 "	220,000	269,898	269,898
Sardine, Pacific	11 mos.	34,768	58,026	69,554
Scallops, sea, New Bedford	10 mos.	13,963	12,362	14,243
Shrimp (heads-on), Gulf States	8 mos.	105,752	104,408	183,862
Squid, California	9 mos.	10,670	10,714	15,790
Tuna and tunalike fishes, Calif.	9 mos.	240,690	265,820	409,596
Whiting:				
Maine	9 mos.	15,727	14,821	14,835
Boston	10 "	966	326	413
Gloucester	10 "	75,676	41,729	46,432
Total whiting		92,369	56,876	61,680
Total of all above items		3,109,385	3,416,318	4,068,738
Other (not included)		598,771	588,205	1,131,262
Grand Total		3,708,156	4,004,523	5,200,000

1/ Preliminary

2/ Dressed weight.

3/ Excluding menhaden.

Note: Round or "as caught" weight unless otherwise indicated.



### U. S. Foreign Trade

**EDIBLE FISHERY PRODUCTS, OCTOBER 1957:** United States imports of edible fresh, frozen, and processed fish and shellfish in October 1957 were higher by 42.4 percent in quantity and 24.6 percent in value as compared with the previous month. Compared with October 1956, the imports for October 1957 were up 1.3 percent in quantity and 1.9 percent in value. Imports in October 1957 were higher than in September for groundfish fillets, dressed salmon, shrimp, canned tuna in brine, and raw tuna. These increases more than offset decreases in swordfish and canned salmon. Compared with the same month in 1956, imports in October 1957 were higher for dressed salmon, shrimp, other fillets, raw tuna, and tuna canned in brine. These increases just about offset the sharply lower imports of groundfish fillets and canned salmon.

Item	Quantity			Value		
	Oct.		Year	Oct.		Year
	1957	1956	1956	1957	1956	1956
<b>Imports:</b>	(Millions of Lbs.)			(Millions of \$)		
Fish & Shellfish:						
Fresh, frozen & processed 1/..	92.4	91.2	786.5	26.3	25.8	231.6
<b>Exports:</b>						
Fish & Shellfish:						
Processed only (excluding fresh and frozen) 1/..	4.2	11.8	82.8	1.3	2.8	19.2

1/ Includes pastes, sauces, clam chowder and juice, and other specialties.

Imports for October 1957 averaged 28.5 cents a pound as compared with 28.3 cents a pound for the same month of 1956.

United States exports of processed fish and shellfish in October 1957 were lower by 19.2 percent in quantity and 43.5 percent in value as compared with the previous month. Compared with October 1956, the exports for this October were down by 64.4 percent in quantity and 55.2 percent in value. The rather sharp decrease in both quantity and value in October this year as compared with a year ago was due primarily to lack of canned California sardines for export. In October 1956 sardine exports amounted to almost 7.0 million pounds.

\*\*\*\*\*

**GROUNDFISH FILLET IMPORTS, NOVEMBER 1957:** During November 1957, United States imports of groundfish and ocean perch fillets and blocks amounted to 10.8 million pounds. Compared with the same month in 1956, this represented an increase of 5.2 million pounds (91 percent). Increases of 2.9 million pounds from Canada and about 2.2 million pounds from Iceland accounted for the rather sharp rise in imports in November 1957 as compared with November 1956.

Canada led all other countries exporting groundfish and ocean perch fillets to the United States with 7.9 million pounds. Iceland was next with 2.2 million pounds. Imports from Norway, Denmark, the Netherlands, and West Germany combined totaled over 750,000 pounds. There were no imports reported from the United Kingdom, France, and Greenland during November 1957, although during the same month of 1956 over 500,000 pounds were imported from France and Greenland.

Imports of groundfish and ocean perch fillets and blocks into the United States during the first eleven months of 1957 totaled 135.2 million pounds--an increase of 785,000 pounds, compared with the corresponding period of 1956. Canada accounted for 77 percent of the total imports during the 1957 period, followed by Iceland with 16 percent, while Norway, Denmark, and West Germany together accounted for 6 percent. The remaining 1 percent came from the United Kingdom, Netherlands, France, Greenland, and Miquelon and St. Pierre.

NOTE: SEE CHART 7 IN THIS ISSUE.

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**IMPORTS OF TUNA CANNED IN BRINE UNDER QUOTA PROVISIO:** The quantity of tuna canned in brine which may be imported into the United States during the calendar year 1957 at the  $12\frac{1}{2}$  percent rate of duty is limited to 44,528,533 pounds. Any imports in excess of that quantity will be dutiable at 25 percent ad valorem.

Imports under the quota from January 1-November 30, 1957, amounted to 38,071,074 pounds, according to data compiled by the Bureau of the Customs. This leaves a balance of 6,457,459 pounds of the quota which may be imported during the balance of 1957 at the  $12\frac{1}{2}$  percent rate of duty.



### Virginia

**BIOLOGISTS FIND THAT CROAKERS GO SOUTH FOR WINTER:** From the Rappahannock to the Neuse River, N. C., in about 75 days, an average distance of three miles a day! That was the journey recently taken by a croaker tagged by the Virginia Fisheries Laboratory, Gloucester Point, Va. This is the first definite evidence that some croakers enter the North Carolina sounds when they migrate from Chesapeake Bay in the fall.

It has been known for some years that in the fall croakers migrate southward. In 1950, two fish tagged by the Virginia Laboratory staff in the ocean off Virginia's eastern shore were recaptured south of Cape Hatteras. Another, tagged at Gloucester Point in June 1957, was recovered recently off the North Carolina coast. But never before has it been known for sure that some croakers enter southern inland waters.

Since early April, biologists of the Virginia Fisheries Laboratory have tagged over 2,000 croakers and released them in Virginia rivers. Recovery of tags has shown that, in general, the fish move up river during spring, swim at random throughout the Bay during the summer, and then move oceanward in the fall.

"We are especially eager to receive tags from fish taken in the winter ocean fisheries," declared a spokesman of the Laboratory. "Almost nothing is known of the whereabouts of croakers in winter when they leave the Bay. Knowledge of their winter haunts may help to explain why the abundance of these important fish fluctuates so greatly."

Virginia scientists have been studying croakers for years. Spawning takes place in the fall and winter in the ocean outside the Virginia Capes and probably also to the southward. The young, no more than a quarter of an inch long, are carried by tidal currents into Chesapeake Bay and up the rivers, often into fresh water. As they grow, they slowly move down-river again. By the following fall the croakers are 5 to 6 inches long and appear at the mouths of rivers and in the lower Bay. Before cold weather, most of them move out of the Chesapeake into the Atlantic. It remains to be shown that the same fish which were nurtured in the Bay one season return there the following spring. Return of tags by sport and commercial fishermen to the Virginia Fisheries Laboratory will help answer some of these puzzling questions.



### Washington

**STATE OPENS HERRING FISHING FOR REDUCTION:** The Washington State Department of Fisheries has established a 15,000-ton quota for herring to be taken in northern Puget Sound during the season which closes February 5, 1958. Until

now herring have not been taken commercially in this area and such fish as have been caught have been utilized almost exclusively as salmon bait. Last year a total of only 261 tons were landed while 40,000 tons were taken in British Columbia waters.

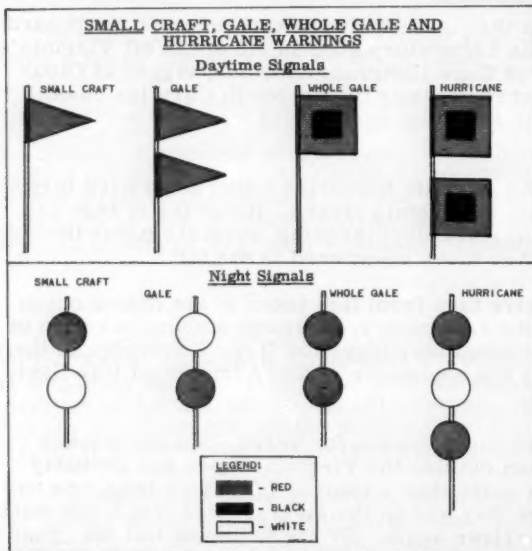
Commenting upon the opening of this Puget Sound herring fishery, the Director of the Washington State Department of Fisheries said: "Our fishermen should share in this harvest. The herring move through American waters and we participate in their protection and regulation. We propose to cooperate with Canadian authorities so the existing annual quota will be shared by fishermen of the two countries without upsetting the balance between yield and spawning."



## Weather

**STORM SIGNALS FOR COASTAL WATERS CHANGED:** The U. S. Weather Bureau announced that a new simplified system of Coastal Warning Displays was placed into effect on and after January 1, 1958. For many years, whenever winds dangerous to navigation have been forecast by the Weather Bureau, storm warning signals

have been displayed along the coasts of the United States, the Great Lakes, the Hawaiian Islands, and Puerto Rico.



THESE NEW STORM WARNING SIGNALS WILL REPLACE THE PRESENT SIGNALS JAN. 1. SMALL CRAFT WARNING INDICATES THAT WINDS UP TO 38 MILES AN HOUR AND/OR SEA CONDITIONS DANGEROUS TO SMALL CRAFT OPERATIONS ARE FORECAST; GALE WARNING, WINDS 39 TO 54 MILES; WHOLE GALE WARNING, WINDS 55 TO 73 MILES; HURRICANE WARNING, WINDS 74 MILES AND ABOVE. THE NEW SIGNALS PROVIDE A NIGHT SMALL-CRAFT WARNING, NOT PREVIOUSLY USED, AND ELIMINATE THE DIRECTIONAL FORECASTS.

Under the new system, only four separate flag signals will be used during the day, instead of the seven separate flag signals previously employed in the Weather Bureau's Storm Warning Display System. During the night, only four comparable lantern signals will be used for Small Craft, Gale, Whole Gale, and Hurricane warnings.

The major differences between the old and the new visual warning display systems are:

(1) The substitution of a single nondirectional gale warning signal for the four separate directional "storm warning" signals that were used to specify northeast, southeast, southwest, or northwest gales.

(2) The introduction of a new lantern signal for use during the night for "small craft warnings." Under the old system displays for small craft warnings were used in daytime only.

(3) The introduction of a new and separate signal for "whole gale" warnings. Under the old system the same signal was used for both "whole gales" and "hurricanes."



The Weather Bureau points out that these visual warning signals which are displayed at stations along the coasts are supplementary to, and not a replacement for, the written advisories and warnings given prompt and wide distribution by radio, television, and press. In most cases, important details of the Weather Bureau's forecasts and warnings in regard to the time, intensity, duration, and direction of storms cannot be given satisfactorily through the display of visual signals.

The explanation of the new display signals that went into effect on January 1, 1958, follows:

**Small Craft Warning:** One red pennant displayed by day and a red light above a white light at night to indicate winds up to 38 miles an hour (33 knots) and/or sea conditions dangerous to small craft operations are forecast for the area.

**Gale Warning:** Two red pennants displayed by day and a white light above a red light at night to indicate winds ranging from 39 to 54 miles an hour (34 to 48 knots) are forecast for the area.

**Whole Gale Warning:** A single square red flag with a black center displayed during daytime and two red lights at night to indicate winds ranging from 55 to 73 miles an hour (48 to 63 knots) are forecast for the area.

**Hurricane Warning:** Two square red flags with black centers displayed by day and a white light between two



## Wholesale Prices, December 1957

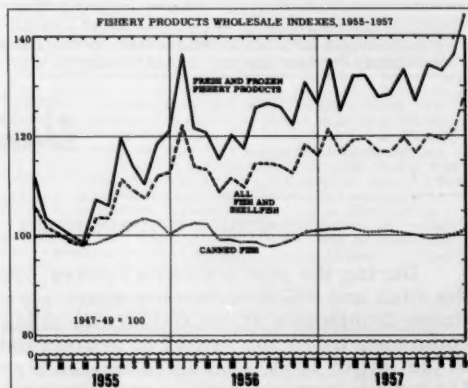
During December 1957 the edible fish and shellfish (fresh, frozen, and canned) wholesale price index (126.6 percent of the 1947-49 average) advanced 4.5 percent as compared with the previous month and was up 9.0 percent from the same month a year earlier. Increases in wholesale prices for fresh and frozen haddock (drawn and fillets) in December 1957 were primarily responsible for the rise.

From November to December 1957 wholesale prices for drawn, dressed, and whole finfish increased 10.2 percent. A sharp increase of 45 percent in fresh drawn large haddock ex-vessel prices at Boston, a small increase in whitefish prices at Chicago, and a slight increase in frozen halibut prices at New York City more than offset declines in the four other varieties in this subgroup. Continued light catches of fresh haddock and low stocks of frozen haddock fillets have kept prices for those commodities at a high level. In December 1957 the wholesale price index for the drawn, dressed, and whole finfish subgroup was 21.6 percent above the same month in 1956 because of much higher prices for fresh haddock (up 122.8 percent) and yellow pike (up 32.0 percent). All other products in the subgroup were substantially lower this December as compared to the same month a year earlier.

Fresh processed fish and shellfish prices in December 1957 were higher by 3.9 percent from the preceding month. High prices for fresh haddock fillets (up 23.7 percent) reflected the increase in ex-vessel prices at Boston. Both fresh shrimp and shucked oysters were priced slightly higher than the preceding month. As compared with December 1956, the index for this subgroup in December 1957 increased by 9.7 percent, due to substantially higher fresh haddock fillet prices (up 88.5 percent) and an increase of 8.5 percent in fresh shrimp prices.

Frozen processed fish and shellfish prices rose 3.7 percent from November to December 1957 due to the firm market for frozen fillets, particularly frozen haddock fillets which were priced 13.6 percent higher. There was no appreciable change in frozen shrimp prices at Chicago. From December 1956 to December 1957 the frozen processed subgroup index was up 9.7 percent due primarily to higher frozen haddock fillet prices (up 34 percent). Ocean perch fillet prices in December 1957 were up by 3.6 percent from the preceding month and the same month in 1956. December 1957

frozen shrimp prices were about the same as the preceding month but were higher by 2.2 percent when compared with the relatively high December 1956 prices.



The canned fishery products subgroup index in December 1957 continued to fluctuate in a narrow range as compared to the previous month and the same month in 1956. Canned Maine sardines declined another 1.5 percent in December 1957 from the preceding month and were down 17.5 percent from December 1956. The short pack of California sardines during the August-December packing season resulted in a 11.6-percent rise in prices from November to December 1957. California canned sardine prices in December 1957 were about 6.7 percent higher than in the same month in 1956. Canning activities for the four products in this subgroup was confined largely to tuna and a small pack of California sardines.

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, December 1957 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices <sup>1/</sup> (\$)		Indexes (1947-49=100)			
			Dec. 1957	Nov. 1957	Dec. 1957	Nov. 1957	Oct. 1957	Dec. 1956
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned) . . . . .					126.6	121.2	119.3	116.1
<u>Fresh &amp; Frozen Fishery Products:</u> . . . . .					144.8	136.1	133.1	126.6
Drawn, Dressed, or Whole Finfish: . . . . .					144.2	130.8	134.3	118.6
Haddock, lge., offshore, drawn, fresh . . . . .	Boston	lb.	.20	.14	206.5	142.4	118.0	92.7
Halibut, West., 20/80 lbs., drsd., fresh or froz. . . . .	New York	lb.	.31	.31	96.9	96.4	109.6	108.3
Salmon, king, lge. & med., drsd., fresh or froz. . . . .	New York	lb.	.61	.64	136.0	143.8	162.9	143.8
Whitefish, L. Superior, drawn, fresh . . . . .	Chicago	lb.	.59	.58	146.3	142.5	158.7	151.2
Whitefish, L. Erie pound or gill net, rnd., fresh . . . . .	New York	lb.	.64	.78	128.4	156.7	197.2	143.6
Lake trout, domestic, No. 1, drawn, fresh . . . . .	Chicago	lb.	.64	.74	131.1	151.6	131.1	145.4
Yellow pike, L. Michigan & Huron, rnd., fresh . . . . .	New York	lb.	.48	.49	111.4	114.9	119.6	84.4
<u>Processed, Fresh (Fish &amp; Shellfish):</u> . . . . .					147.8	142.2	133.8	134.7
Fillets, haddock, sml., skins on, 20-lb. tins . . . . .	Boston	lb.	.58	.47	195.7	158.2	132.7	103.8
Shrimp, lge. (26-30 count), headless, fresh . . . . .	New York	lb.	.89	.88	140.6	138.3	122.5	129.6
Oysters, shucked, standards . . . . .	Norfolk	gal.	6.00	5.88	148.5	145.4	148.5	148.5
<u>Processed, Frozen (Fish &amp; Shellfish):</u> . . . . .					129.7	125.1	119.2	118.2
Fillets: Flounder, skinless, 1-lb. pkg. . . . .	Boston	lb.	.40	.39	103.4	100.8	100.8	103.4
Haddock, sml., skins on, 1-lb. pkg. . . . .	Boston	lb.	.38	.33	117.7	103.6	89.5	87.9
Ocean perch, skins on, 1-lb. pkg. . . . .	Boston	lb.	.29	.28	114.8	110.8	108.8	110.8
Shrimp, lge. (26-30 count), 5-lb. pkg. . . . .	Chicago	lb.	.84	.84	128.8	130.0	128.1	126.0
<u>Canned Fishery Products:</u> . . . . .					100.8	100.0	99.7	101.2
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs. . . . .	Seattle	cs.	22.65	22.65	120.0	120.0	120.0	120.0
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs. . . . .	Los Angeles	cs.	11.50	11.50	82.9	82.9	82.6	80.8
Sardines, Calif., tom, pack, No. 1 oval (15 oz.), 48 cans/cs. . . . .	Los Angeles	cs.	9.60	8.60	112.0	100.4	99.2	105.0
Sardines, Maine, keyless oil, No. 1/4 drawn (3-1/4 oz.), 100 cans cs. . . . .	New York	cs.	6.35	6.45	67.6	68.6	68.7	81.9

<sup>1/</sup>Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.



### FISH PROTEIN EQUAL TO BEEF PROTEIN

During the past several years, trials have been conducted with coeds by the Fish and Wildlife Service under a cooperative project with the College of Home Economics at the University of Maryland. A basal diet has been developed containing only ten grams of protein daily. The girls, for a period of 7½ weeks in the fall of 1954, consumed this low protein diet to determine how effectively fish protein would replace the protein loss compared to beef. One group was fed haddock protein in increasing levels. Another group received beef protein at the same levels. Tests of blood and the determination of the nitrogen balance of the body confirmed previous reports which indicated no differences in the blood-forming ability of fish protein compared to that of meat.

--Sea Secrets, The Marine Laboratory,  
University of Miami, Coral Gables, Fla.



### International

**CONVENTION RECOMMENDED BETWEEN UNITED STATES AND CUBA ON CONSERVATION OF GULF OF MEXICO SHRIMP RESOURCES:** As a result of meetings November 18-22, 1957, in Havana, Cuba, on the conservation of the shrimp resources of the Eastern Gulf of Mexico, the official delegations of the United States and Cuba drafted an agreement that is to be recommended to their respective Governments for adoption in the form of a Convention. This agreement contemplates international cooperation between Cuba and the United States aimed at developing and maintaining the maximum sustainable yield from these shrimp resources. The agreement also contemplates cooperation in the enforcement of regulations that may be adopted in accordance with the Convention.

The Convention will provide for the establishment of a bi-partite commission constituted by representatives of both Governments, which will be in charge of the fulfillment of the functions provided for in the agreement.

During the course of the meetings, the delegates to the conference examined carefully the problem of the conservation of the shrimp resources of common interest in the Eastern Gulf of Mexico in the light of available scientific information.

### FISHERY TRADE FAIRS HELD IN DENMARK AND ENGLAND

The Fishery Trade Fair held in Copenhagen, Denmark, from September 30 to October 5, 1957, and the International Fisheries Exposition held in Lowestoft, England, from October 21-26, 1957, consisted primarily of exhibits of equipment for the fishing industry. No types of equipment radically different from types well known to the United States fishing industry were shown, but there was evidence that European manufacturers have attempted to design some of their equipment to answer specific needs of the fisheries. The potential market for equipment for new vessels is substantial since most northwestern European construction yards appear to have a large backlog of fishing vessel construction orders. Furthermore, the wide use by the fishing industry of electronic and mechanical aids was evident from the number of exhibitors showing sonic devices for fish location and electronic aids to navigation. Northwestern European fishing vessels in general appear to carry more instruments than do United States vessels of comparable size.

The large number of net and twine manufacturers with exhibits, featuring synthetic nets and twine for many fishing uses, is suggestive of a highly competitive but expanding market for this equipment in Europe.

Equipment for depth-sounding and fish finding was shown in an especially large number of models. Some particular advantages were claimed for each model, and also something was added to the cost of the instrument for each refinement.

Two conclusions about the primary fish production equipment of northwestern Europe are inevitable from a visit to these fairs as well as from observations of typical fishing vessels of the area. One is that they have more specialized equipment than most United States vessels of comparable size. Another is that the electronic equipment carried is usually more precisely adapted to a particular kind of fishing situation than it is in the United States.

In such a good and compact marketing area, it is not surprising to find equipment manufacturers spending more effort on the development of fishing equipment and incidentally on the development of fisheries. The "Decca" system of navigation

is an example of this. It has come into very general use on the medium-size and small trawlers which operate in the North Sea and adjacent areas. The system requires the erection and permanent maintenance of shore stations. It is said to be more accurate than Loran, but the range from shore stations is a maximum of about 240 miles. The system or similar systems have long been in use for aircraft. Although the equipment is said to be in use on about 1,000 medium-size fishing vessels, it was not on the several distant-water trawlers observed. This supports the argument that the "Decca" navigation equipment is principally used to find specific fishing locations, and to avoid snags or wrecks which are in known positions rather than to function primarily in traverse navigation. Distant-water trawlers which fish in areas not covered by the "Decca" shore stations use radio-direction finders, depth-sounders, radar, and, on some vessels, Loran for traverse navigation as supplements to celestial navigation and dead reckoning.

One distant-water trawler visited was only two years old, but it had two radar receivers, three separate sonic depth-sounders, or fish-finder systems, and two radio-direction finders.

The Fishery Trade Fair at Copenhagen also had exhibits of processed fishery products, but the greater emphasis was on equipment for fishing vessels or fish processing. Approximately 100 companies had booths at each fair. The Copenhagen fair had a wider range of exhibits and a greater representation of manufacturers from Continental Europe and Japan. The Lowestoft Exhibition, although not exclusively for English manufacturers, had a more local flavor and a particularly large section devoted to Diesel engines.

The Copenhagen Fair was housed in a single large auditorium-like structure which occupied about one city block in the central part of the city.

The Lowestoft Exhibition was held at the Pier Pavilion and at Kensington Hall, located about a mile apart in Lowestoft. Very few United States manufacturers were represented, except through their European subsidiaries, at either exhibition.

### NORWEGIAN-U. S. S. R. NORTH ATLANTIC SEALING AGREEMENT

At the invitation of the Norwegian Government, negotiations have been conducted in Oslo during the period November 13-22, 1957, between a Norwegian and a Soviet delegation concerning sealing in the areas in the northeastern Atlantic Ocean where the two countries are engaged in sealing.

It was decided to conclude an agreement between the two countries with the view to establishing cooperation with regard to scientific investigations and control measures to ensure a rational and responsible utilization of the seal population. The agreement comprises Greenland seal, hooded seal, and walrus, eventually with the possibility of later expanding the agreement also to embrace other types of polar animals.

Agreement was reached on implementing the following regulations on catching:

For the Jan Mayen field (the Western ice field) and for the northern catching area (the Northern ice field), the catching season is fixed from March 20 to May 5, and for the eastern catching area (the Eastern ice field), from March 1 to May 10. In the Denmark Straits, Norwegian ships which have been catching in this area in recent years will temporarily be permitted to catch during the period June 15 to July 15. As regards catching of walrus, agreement was reached on holding to the complete ban which both countries now maintain.

Under the agreement, a commission will be founded with representatives of the two countries, and this commission can make proposals on amendments and annexes to the regulations on which agreement has now been reached.

The negotiations also touched upon sealing in the White Sea where Norwegian sealers, according to an agreement with the Government of the Soviet Union in 1926, have had limited access to catching seals. Norwegian seal catchers have not been engaged in this activity since the last war.

The Soviet delegation, for its part, pointed out that for various reasons, among others, biological and catching, there was no basis for giving Norwegian seal catchers permission to resume catching in the White Sea.

As agreement on satisfactory control measures in the other areas was also achieved, and both delegations positively supported maintaining the foundation for a continued responsible utilization of the seal population, the Norwegian delegation found that it could make a statement that it would recommend to the Norwegian authorities to request the Norwegian seal catchers to relinquish their rights under the agreement of 1926.

The negotiations took place in the best understanding and showed that both parties laid great stress on the establishment of future cooperation with regard to the question of a rational utilization of the seal population in the interest of both countries.

### FOOD AND AGRICULTURE ORGANIZATION

WORLD FISHERY CATCH, 1956: The total world fishery catch continues to increase and is now approaching 30 million metric tons a year (round or live-weight basis), according to figures published in the latest Yearbook of Fishery Statistics issued on October 31, 1957, by the Food and Agriculture Organization (FAO). The actual catch for 1956 was 29,330,000 metric tons. The continued increase in the world fishery catch is indicated by the following (in metric tons): 20,440,000 in 1938; 19,160,000 in 1948; 24,750,000 in 1953; 26,690,000 in 1954, and 27,940,000 in 1955.



There now are eight countries catching more than one million tons of fish yearly, India having reached this total for the first time in 1956. Japan remained far in the lead as the number-one fishing country.

The first eight accounted for 62.1 percent of the world catch; the remaining 26 countries caught 30.4 percent of the total.

Herring, sardines, anchovies, and related species (6,990,000 metric tons) make up the largest section of the world catch by species. Next in order are mixed and unidentified fish, 5,240,000 tons; cod, hake, haddock, etc. 4,880,000 tons; and fresh-water fish 3,070,000 tons.

Asian countries accounted for 11,830,000 tons of the world total catch. Europe came second with 7,970,000 tons, and North America third with 4,180,000 tons. The U. S. S. R. was fourth with 2,620,000 tons.



Table 1 - World Fishery Catch and Catch of 8 Largest Fish-Producing Countries, 1938, 1948, 1953-56

Countries	Per cent <sup>1/</sup>	1956	1955	1954	1953	1948	1938
	%	(1,000 Metric Tons)					
World Total	100	29,330.0	27,940.0	26,690.0	24,750.0	19,160.0	20,440.0
Japan . . . . . <sup>2/</sup>	16.3	4,762.6	4,912.8	4,544.6	4,521.6	2,431.4	3,562.0
United States <sup>2/</sup>	10.0	2,935.9	2,738.9	2,706.4	2,437.5	2,409.9	2,253.1
China Mainland	9.0	2,640.0	2,518.0	2,294.0	1,890.0	3/ (448.0)	1,500.0
U. S. S. R. . . .	8.9	2,617.0	2,498.0	2,258.0	1,983.0	1,486.0	1,523.0
Norway . . . . .	7.3	2,128.9	1,813.4	2,068.2	1,557.1	1,504.0	1,152.5
Canada <sup>4/</sup> . . . .	3.7	1,076.9	954.1	1,025.8	925.1	1,052.9	836.8
United Kingdom	3.6	1,050.4	1,100.4	1,070.2	1,122.0	1,206.1	1,198.1
India . . . . .	3.4	1,012.3	839.0	828.5	819.0	-	-
Total for 8 Largest Countries	62.1	18,220.0	17,370.0	16,800.0	15,260.0	11,840.0	12,730.0

<sup>1/</sup> CATCH AS PERCENTAGE OF GRAND TOTAL BASED ON 1956 FIGURES OR LATEST YEAR SHOWN.

<sup>2/</sup> INCLUDES ALASKA.

<sup>3/</sup> DATA FOR 1949 SHOWN.

<sup>4/</sup> INCLUDES NEWFOUNDLAND.

NOTE: LIVE- OR ROUND-WEIGHT BASIS.

Most of the approximately 10-million-ton increase in the world catch since the World War II (19,160,000 tons in 1948; 29,330,000 tons in 1956) took place in Asia, where the total catch has risen by more than 5,000,000 tons--from 6,580,000 in 1948 to 11,830,000 tons in 1956. The next biggest increase was in Europe, where the total in 1956 was 7,970,000 tons compared with 6,140,000 tons in 1948--a rise of more than 1,800,000 tons. The U. S. S. R. catch increased by more than 1,000,000 tons over the same period.

\* \* \* \* \*

**FISHING GEAR CONGRESS HELD:** The first International Fishing Gear Congress, held in Hamburg, West Germany, October 6-12, 1957, under the auspices of the Food and Agriculture Organization (FAO) was attended by two representatives of the U. S. Bureau of Commercial Fisheries.

These representatives report that the most remarkable feature and accomplishment of the first International Fishing Gear Congress was that it assembled a group of participants including not only fishing gear technologists, fishing gear manufacturers, and fishermen, but also fishery biologists, fishery administrators, publishers of fishery periodicals, and others. Furthermore, the subjects discussed were sufficient to sustain the interest of most of those present through six days, five of which were devoted to formal meetings.

More than 480 participants from 37 countries were registered and more than 100 papers were discussed. The arrangements for the Congress were competently handled by the FAO staff, and a simultaneous system gave a choice of English, French, Spanish, or German translations. A. W. Anderson, Assistant Director of the U. S. Bureau of Commer-

cial Fisheries, acted as general chairman. Since there was insufficient time for all papers to be read and discussed, a rapporteur appointed for each session summarized papers for discussion by the group.

Extensive discussions concerned nomenclature to designate types of twines for nets. The subject is complicated by the fact that textile manufacturers have a complex terminology of their own differing from that familiar to fisheries people. Furthermore, new types of synthetic materials and new methods of processing natural materials, knitting, and handling nets are appearing so rapidly that a standard nomenclature is difficult to establish. Some papers presenting basic data for future classification of net materials were presented.

Scientific approaches to problems with trawl efficiency require knowledge of speed of trawling and factors of water resistance. Discussions brought out the fact that almost nothing, which is sufficiently exact to be useful, is known about trawling speeds. Also, very little is known about the water resistance of various parts of the gear or the relative effects of water resistance and ground friction in trawling gear. Dis-

cussions about the use of models called attention to the difficulty in bridging the gap between very small models and full-size gear. It was suggested, however, that model studies should be worth while especially with larger models used in large model basins. These discussions were of special interest in connection with present work of the U. S. Bureau of Commercial Fisheries gear research unit since a project involving precise measurements of trawling speeds and gear resistance is in progress.

Reports of additional refinements in methods for attracting fish with light were of considerable interest and other attraction methods were discussed at length. It was pointed out that basic studies in the behavior and responses of fishes to attracting devices and materials needed more study and offered a promising field for investigation.

A summary of the subjects discussed follows:

**Materials:** Old and new net materials, their use and life, with particular reference to new synthetic fibers such as terylene, dacron, saran, vinylon, and various mixtures. Research on strength of natural fibers. Standardization of terms and possibility of universal conversion tables. Comparison of characteristics of modern nets and methods of testing. Preservation and maintenance of gear nets and lines made from different materials.

**Net Construction and Use:** Testing theory by experiment with models; measuring instruments and observation underwater of behavior of gear and reaction of fish to gear; selectivity of gear; comparative fishing experiments; methods of

NOTE: A BOOK, MODERN FISHING GEAR, IS TO BE PUBLISHED AS A COMPANION VOLUME TO FISHING BOATS OF THE WORLD (PUBLISHED IN 1950) AND WILL CONTAIN MUCH OF THE MATERIAL AS PRESENTED AT THE HAMBURG CONGRESS. IT WILL BE AVAILABLE THROUGH FISHING NEWS, 110 FLEET STREET, LONDON EC 4, ENGLAND.

specifying the shapes, dimensions, quality, and other characteristics of nets.

**Mechanics of Net Construction:** Mechanical knitting and various problems with synthetic fibers; Japanese knotless nets; relative merits of different fibers; bonded twines; thermoset twines; single, double, and special knots; knot tightening, etc.; tailoring of nets according to drawing and diagrams; specifications of work and maintenance.

**Operation of Fishing Gear:** Deck equipment, layout of vessels, choice of gear for principal fisheries; labor-saving and power-handling of gear by deck machinery, remote control, automatic release, and overload; instruments for measuring gear and recording and controlling performance; hauling techniques, treatment and storing of catch; unloading facilities on vessels.

**Tactics in Locating and Catching Fish:** Charts of known grounds; hydrographic aids in thermometers, current meters, and plankton samplers; direction-finding gear; echo-sounders of all types; aerial scouting, acoustic aids, and underwater television cameras; light and other lures, bait, and chemical attractants.

**Electrical Fishing:** Factual summary of existing knowledge in both fresh- and sea-water application.

Likely future developments in all classes of world fishing—new devices for locating and attracting fish; newly-developed gears and methods of increased power handling; new methods in preserving and processing catches on board which affect the size of vessels, their range, operation, and type of equipment; factoryship operation; use of catchers as supplements; fish carriers to market, etc.

\* \* \* \* \*

**REPORT ON NINTH SESSION OF FAO CONFERENCE:** The Ninth Session of the Conference of the Food and Agriculture Organization opened on November 2, 1957, in Rome, Italy. The Conference, which is the chief legislative and policy-making organization of FAO (of which the United States and 76 other countries are members), was opened by the Director-General who welcomed delegates and observers of both governmental and nongovernmental organizations. The meetings lasted three weeks and ended on November 22, 1957. World problems in agriculture, fisheries, forestry, and nutrition were discussed.



THE BEST WAY OF OVERCOMING THE GENERAL LACK OF PROTEIN IN THE DIETS OF THE FAR EASTERN POPULATIONS IS BY INCREASING THE PRODUCTION AND CONSUMPTION OF FISH. THE FOOD AND AGRICULTURE ORGANIZATION SENT AN EXPERT IN FISH CULTURE TO THAILAND TO TRAIN AND ASSIST THAI TECHNICIANS IN IMPROVING AND DEVELOPING THE INLAND FISHERIES RESOURCES OF THEIR COUNTRY. THIS PHOTOGRAPH SHOWS EXPERIMENTAL FISHING IN A RIVER WITH A SEINE NET.

Fishery advisers on the United States delegation to the Conference included A. W. Anderson,

Assistant Director, U. S. Bureau of Commercial Fisheries, and Charles E. Jackson, General Manager, National Fisheries Institute, Washington, D. C.

**Director-General's Policy Statement:** At the third plenary meeting on November 5, B. R. Sen, Director-General of FAO, presented a policy statement to the Conference in which he stressed that balanced development of the economy as a whole, including the agricultural sector, was essential to the practical success of all economic programming. He added that technical aid to development can only have its greatest effect if it is geared to the capacity of the recipient country to absorb it effectively, and therefore proposed an extension of FAO's program of fellowships and training centers as a means of enabling domestic administrative systems to increase their capacities to absorb. He called on delegates to help in the promotion of an international code of ethics in economic affairs, and referred to the FAO principles of surplus disposal which have been subscribed to by nearly 40 members in their commodity dealings. In addition, he asked the National FAO Committees and National Committees to use their greatest efforts to bring to the villages and homes the benefits of science and technology in improving their positions as both producers and consumers of food.

**Conference Organization and Agenda:** The Conference was divided into three Commissions: Commission I covered the world food and agriculture situation; Commission II concerned itself with the current and prospective activities of FAO; and Commission III discussed constitutional, administrative, and financial questions.

Principal items on the agenda included a statement on the over-all Technical Assistance position, consideration of work accomplished, and program of work for 1958/59; reports of fisheries councils; report on public relations activity; and program trends and development beyond 1959.

**Program of Work and Budget:** At the Tenth Plenary Meeting of the Conference on November 8, the Conference approved the Report of the General Committee, "Consideration of the Program of Work and Budget" (C 57 Limited/20).

**Food Shortages:** At the first meeting of Commission I, the Director-General pointed out that for FAO the basic problem is still one of food shortages, and the specific problem of surpluses is one of distribution rather than of overproduction. He further referred to the need of securing a measure of stability for the prices of agricultural products. The Director-General also referred to data contained in Document 57/8 regarding nutrition levels, which clearly demonstrate that poverty is at the root of the world nutritional inadequacies and that therefore these can be overcome ultimately only by general economic development.

**New Members:** The Conference on November 10 voted to re-admit Poland and to grant membership to the newly-independent countries of Ghana and Malaya. This brings FAO's total membership to 77.

**African Regional Office:** The Conference was asked to establish an African Regional Office to stimulate and guide the agricultural development of the member countries of that continent. A Commission of the Conference approved a resolution put forward by the delegate of Morocco, asking the Director-General to put into effect "as soon as possible" a proposal he had made earlier for the establishment of an FAO Regional Office for Africa.

The Director-General, in outlining his request for funds to strengthen the Organization's regional structure, said that "for some time to come, the problems of the African countries will fall largely within the field of FAO's responsibility."

The Moroccan resolution was passed by a vote of 44 to one, with one abstention. The new African countries of Morocco, Tunisia, the Sudan, and Ghana strongly urged immediate action. The Ghana representative summed up their viewpoint when he said that FAO's help was urgently needed in Africa which is "so vast and has so many problems and needs."

**Improving Regional Structure:** The Director-General's over-all plan for improving the regional structure of FAO and strengthening the service and liaison it can provide to member governments was approved in principle by the Conference Commission.

The Director-General's plan calls for the appointment of 21 highly-qualified technicians--5 in the Far East, 5 in the Near East, 10 in Latin America and 1 in North America--and the assignment of a senior officer at FAO Headquarters, to develop closer liaison with European Governments.

**Technical Committee on Fisheries:** The first meeting of the Technical Committee on Fisheries was held on November 12 at which time it adopted its agenda (Document C 57/LIM/10) and appointed Erik Heen of Norway as chairman and A. W. Anderson of the United States and Luis Howel Rivero of Cuba as Vice Chairmen. Anderson indicated that there was excellent representation by countries at the meetings of the Committee and that they were the best ever held from the point of view of discussions and interest. There were participants from 34 countries, including Australia, Belgium,

Burma, Canada, Ceylon, Chile, Colombia, Cuba, Denmark, Egypt, France, Germany, Ghana, Haiti, Honduras, Iceland, India, Indonesia, Italy, Japan, Lebanon, Libya, Morocco, Netherlands, Norway, Pakistan, Portugal, Philippines, Spain, Sweden, Turkey, United Kingdom, United States, and Yugoslavia. In addition, there were two observers.

The Technical Committee on Fisheries at its first three meetings (November 12 and 13) received an introductory statement by the Director of FAO's Fisheries Division and later the Chief of the Program Coordination Service of the Fisheries Division described the over-all Technical Assistance Program of the Division. This was followed by consideration of the work accomplished and program of work for 1958/59 for the Biology Branch, the Technology Branch, and the Economics and Statistics Branch. Also, the Committee received a report on the work of the General Fisheries Council for the Mediterranean, the activities of the Indo-Pacific Fisheries Council, and the work carried out in the Latin American region. General consideration was given to the over-all program of work of the Division of Fisheries and the Committee found it to be sound and well balanced.

The draft of the report (C 57/LIM/34) of the Drafting Committee was approved by the Technical Committee on Fisheries at its fifth meeting on November 16 and the report was then presented to Commission II for approval. After approval by Commission II, the report was adopted by the Conference.

**REPORT OF THE TECHNICAL COMMITTEE ON FISHERIES:** 1. The Conference examined the results achieved by the Fisheries Division during the past two years, as well as the program of work for the succeeding two-year period. It recorded its satisfaction of the way in which the Division had performed its task within the funds available and was of the opinion that the proposed program of work was sound, adequately balanced, and suitably orientated.

2. Regret was expressed regarding the discontinuation of the FAO Fisheries Bulletin and it was hoped that the substitute publications proposed would prove satisfactory.

3. The Conference commended the summary form in which the various Branches of the Division had reported on their work; this resulted in a much

clearer picture of the accomplishments achieved and projects proposed. The desirability of circulating such summaries to governments at least two months ahead of future sessions of the Conference was stressed.

4. The progress of the Technical Assistance Program was noted with satisfaction. Recipient countries were urged to make proper preparations before arrival of experts, to provide suitable working facilities, necessary equipment and counterpart assistance. There was general agreement that every means should be explored to improve the method of recruitment of experts and to make more use of the assistance which national fisheries administrations could provide. It was also recommended that, in the case of fellowships, the maximum of advance information should be supplied to the country to be visited and careful programming be made in good time and adhered to.

5. The Biology Branch's performance and program as a whole was endorsed. It was agreed that primary attention should be given to those projects having a direct bearing on increased food production and the optimum utilization of aquatic resources. The Conference was glad to note the close cooperation in scientific research which continued between FAO and other agencies and satisfied themselves that there was no duplication in that respect.

6. The program of the Technology Branch and the work performed by it was fully appreciated and approved on account of its direct relation to the improvement of fish production, processing and distribution. It was the general opinion that the meetings which had already taken place on the subjects of fishing boats, fishing gear, and fish processing had served a most useful purpose in calling attention to recent developments and in bringing together fishermen, administrators, scientists and representatives from various branches of the industry. It was recommended that such meetings be followed by other meetings of the same kind and that a six-year period between each seemed reasonable, it being understood that each meeting should be centered around a definite theme. Appreciation of the usefulness of World Fisheries Abstracts, already expressed by previous Conferences, was reiterated and the Conference noted with satisfaction the work being undertaken with respect to the preparation of handbooks and of technological dictionaries. Interested countries stated their willingness to review the drafts of such dictionaries and urged that the project be completed with the utmost celerity.

7. The work accomplished by the Economics and Statistics Branch was highly commended, particularly the rapidity with which the Yearbook of Fishery Statistics was now produced and the improvements which had been introduced in the latest edition. It was recommended that the direct contacts established with fisheries administrations in various countries, which had proved of the greatest assistance in this connection, should be expanded. The difficulties still to be overcome in the collection of statistics on fishing boats, manpower and productivity, and in the organization of fisheries censuses were noted. It was recognized that the limitation in these matters rested not only with the facilities available to this Branch, but also with the ability of governments to supply this particular kind of information. The interest in developing fishery cooperatives was noted. While FAO does not normally take the initiative in promoting the development of cooperatives, it will have to study this system to be able to assist governments interested in this field in determining the most appropriate forms of organization and management.

8. It was noted that, with the staff now available, the Branch could not undertake a wider program in procuring commodity information and comprehensive fisheries intelligence.

9. The reports of the Indo-Pacific Fisheries Council and the General Fisheries Council for the Mediterranean were received and approved, and the budget proposed by the Director-General for the Indo-Pacific Fisheries Council was adopted. The collaboration and cooperation between the Fisheries Division and these councils were reviewed and approved.

10. The work of the Latin American Regional Office in relation to the formation of a Latin American Fisheries Council was considered, as well as the results obtained by the various training centers which took place in this part of the world.

11. The Conference was impressed by the activities of the Division since the last session in disseminating intelligence and information on its work, and by the many reports and feature articles written and distributed to the world press, and it was recommended that this work should be continued and improved.

#### Future Trends and Developments Beyond 1959:

12. With the increase in the number and activities of the regional fisheries councils, it was apparent that the cost of servicing them should be studied, and a policy should be recommended which would recognize the extent of FAO's role. Special attention should be given to African territories south of the Sahara, especially in the fields of marketing and cooperatives.

13. The program of work in biology should continue to give primary attention to those projects having a direct bearing on increased food production, and the optimum utilization of aquatic resources; emphasis should be laid on giving support to the efforts of individual countries in discovering and forecasting stocks.

14. FAO should intensify its work in matters of water pollution, pollution of the sea by oil, and by radio-active wastes. The closest possible collaboration should be established with other international bodies dealing with these matters.

15. Every effort should be made to continue to improve the circulation of World Fisheries Abstracts.

16. The convening of technological meetings or congresses was recommended, in order to keep abreast with the latest developments.

17. The paramount importance of problems related to boat construction was confirmed, and special attention should be given to all questions of general interest in this field, such as the question of scantlings of wooden boats.

18. The collection and publication of statistics should be continued and intensified but every effort should be made to simplify the reporting of statistics by individual countries to FAO and other international agencies.

19. Assistance in the study of the economic aspects of the rational exploitation of fishing grounds should be emphasized.

20. Note was taken that the increase of fish production would lead to development of international trade and to problems of adjustment. Countries would therefore appreciate being supplied with the necessary commodity information which would facilitate trade expansion, but care should be taken not to duplicate work already in progress.

21. Particular attention should be given to the work relating to cooperatives and work on marketing should be emphasized.



22. In view of the difficulty in recruiting experts, it would be of great assistance to all concerned if arrangements could be made to grant long-term appointments to them.

23. Attention was drawn to the advisability of granting more fellowships, to the selection of the

NOTE: ALSO SEE COMMERCIAL FISHERIES REVIEW, DECEMBER 1955, p. 43.

regions where the fellows were to be trained, and to permitting countries which were not eligible for Technical Assistance to benefit from this scheme.

24. The encouraging results obtained warranted an increase in the number of suitably selected training centers. A system of study tours for groups should be considered.

### INTERNATIONAL (EUROPEAN) FISHERIES CONVENTION OF 1946

**SIXTH MEETING OF PERMANENT COMMISSION:** The Sixth Meeting of the Permanent Commission of the International (European or North Sea) Fisheries Convention of 1946 took place in London October 22-25, 1957. Delegations attended from all the 13 member countries, namely, Belgium, Denmark, the Federal Republic of Germany, France, Iceland, Ireland, Netherlands, Norway, Poland, Portugal, Spain, Sweden, and the United Kingdom. Observers were present from the Union of Socialist Soviet Republics for the second time and from the United States for the first time. Observers from the International Council for the Exploration of the Sea, the Food and Agriculture Organization, and the International Commission for the Northwest Atlantic Fisheries also attended. The Convention provides for regulating the size of net meshes and fish size limits.

Much of the discussion in the Commission was concerned with the comments by Contracting Governments on the content of the report of an Ad Hoc Scientific Committee which had been set up in 1955 to review available information and to advise the Commission on minimum mesh sizes and minimum size limits for fish.

The Commission decided to appoint a committee to consider what were the precise difficulties of member countries as regards the application of the present mesh provisions of the 1946 Convention and what might be done to meet those difficulties consistent with the purposes of the Convention and to report back to the Commission at its next Meeting. The committee will hold its first meeting in London in January 1958. It was decided that, in the meantime, for a further period of three years ending on April 4, 1961, the minimum mesh size for ordinary trawls should remain at 75 mm.

The Commission also decided that the provisions of the Convention whereby landings of fish taken by the industrial fisheries of member countries should be allowed to include 10 percent by weight of undersized fish of species covered by the Convention until May 1, 1960. The effect of industrial fisheries on the species of fish covered by the Convention was brought to the attention of the Liaison Committee of the International Council for the Exploration of the Sea in order that they might keep the question under close review.

The Commission also considered the question of the effectiveness of the conservation measures introduced in the northern part of the Convention area and requested the Liaison Committee of the International Council for the Exploration of the Sea to promote as a matter of urgency a study of the problem of conservation of the Arctic cod stocks and to report to the Commission as soon as possible.

The Commission will hold its next meeting in Dublin beginning on November 25, 1958.

### INTERNATIONAL WHALING COMMISSION

**AMENDMENTS TO CONVENTION ENTER INTO FORCE:** The amendments to paragraphs 5, 8(a) and (c), and 11 of the schedule of the International Whaling Convention of 1945 adopted at the ninth meeting of the Commission, held in London June 24-28, 1957, entered into force on October 4, 1957.

## NORTH PACIFIC FUR SEAL COMMISSION

**JAPAN AND U. S. S. R. RATIFY INTERIM CONVENTION:** Japan on September 20, 1957, and the Union of Soviet Socialist Republics on October 14, 1957, deposited ratifications for the Interim Convention on the Conservation of North Pacific Fur Seals, signed at Washington February 9, 1957. As the United States and Canada have already deposited their ratifications, the Interim Convention entered into force on October 14, 1957.

\*\*\*\*\*

**CONVENTION ENTERS INTO FORCE:** The Interim Convention on the Conservation of North Pacific Fur Seals, signed at Washington on February 9, 1957, entered into force on October 14, 1957. A proclamation by the President of the United States was issued on November 15, 1957.

## NORTHWEST ATLANTIC FISHERIES COMMISSION

**TRAWL REGULATIONS:** By a circular note of November 15, 1957, the Depository Government (United States) has informed the Contracting Governments that following notification of acceptance by the Governments concerned, the 1955 proposals for regulations of the trawl fisheries for cod and haddock in Subareas 3, 4, and 5 become effective for all contracting Governments from January 1958.



The amendment to the regulations providing for a restricted use of a cover for the protection of the cod end agreed to at the 1957 Annual Meeting of the International Commission for the Northwest Atlantic Fisheries (ICNAF) is being considered by the Governments concerned.

**PANEL 5 ADVISERS MEET:** A meeting of the Scientific Advisers to Panel 5 was held in Quebec City from December 3-5, 1957. Scientific Advisers to Panel 4 were invited but no European representatives were able to attend. Scientists from Canada, the United States, and the ICNAF Secretariat attended the meeting. Meeting facilities were arranged by the Quebec Department of Fisheries.

Among the topics studied were the assessment of the effects of the 4½-inch mesh regulation on the haddock fishery of Subarea 5; the results of current research work on the cod, haddock, and ocean perch (redfish) of Subareas 4 and 5.

The research on the scallop fishery of Subarea 5 (Georges Bank) was reviewed in relation to the possible need for regulation of this valuable fishery. Suggestions were made for special lines of research; the results of which were considered essential before appropriate regulations could be designed or recommended.

**1958 ANNUAL MEETING:** The Commission's annual meeting will be held at its headquarters on the Campus of the Dalhousie University, Halifax, Canada, in the week beginning June 9, 1958. It will be preceded (June 4-7) by meetings of the Groups of Advisers and the Standing Committee on Research and Statistics. (Commission's Newsletter No. 26, reporting activities during October-December 1957.)



### Australia

**CANNED FISH PACK INCREASED IN FISCAL YEAR 1956/57:** The canned fish pack (exclusive of shellfish and fish paste) in Australia during the 1956/57 fiscal year (ending June 30) amounted to about 7.9 million pounds. This was an increase of about 32 percent over the 6.0 million pounds canned during fiscal year 1955/56. Record packs of tuna and Australian salmon (*Arripis trutta*) helped to boost the canned fish pack, according to figures released by the Australian Commonwealth Bureau of Census and Statistics. No breakdown of the canned fish pack by species was given. During the present fiscal year, Australian fish canneries may have to face the competition of increasing imports from Japan.

\* \* \* \* \*

**QUEENSLAND SHRIMP FISHING GROUNDS MAY BE EXTENDED:** Following the discovery of shrimp fishing grounds off Fraser Island in southern Queensland, the Australian government-chartered fishing vessel *Challenge* explored the areas north of Hervey Bay for shrimp. During August 1957 exploratory shrimp fishing was conducted between Rockhampton and Cape Hillsborough, north of Mackay. Small quantities of banana, king, and tiger shrimp were caught. As the banana shrimp are taken in Hervey Bay immediately after the rainy season, it was suggested to the fishermen that they try fishing in the new areas during and shortly after the rainy season.

The survey turned up two new species of shrimp. One species, previously known only from Japan, is a pink to crimson hunchbacked shrimp (*Metapenaeopsis lamellatus*, De Haan) and the other, a small spring shrimp with a heavy carapace (*Eusicyonia lancifer*, Olivier). (*Fisheries Newsletter*, October 1957.)

\* \* \* \* \*

**SCALLOP FISHING AREAS MAY BE EXTENDED:** It has been known for some time that scallop beds exist in Port Phillip Bay (southeastern part of Australia in State of Victoria). The species is *Notovola alba*, which is similar to the Tasmanian king or commercial scallop.

Besides occurring in Port Phillip Bay, the commercial scallop occurs off Lakes Entrance in Victorian waters. It has been common for scallops to be brought up attached to various fishing gear. After strong westerlies, live scallops are washed up on the shore of the southeast corner of Port Phillip Bay near Rosebud. All this evidence suggested that beds extensive enough to support a small commercial fishery might exist.

The extent of the Port Phillip Bay beds was investigated by the Victoria Fisheries and Game Department in 1949/50. Trial dredgings were carried out over the most promising localities. Two standard Tasmania scallop dredges with a 4-foot wide blade and a 2-inch cyclone wire mesh in the bag were used. The best catch in a 15-minute haul was 65 scallops per dredge.

The heaviest concentrations were found off Dromana, Point Cook, Portarlington, Williamstown, and Rickett's Point in depths from 7 to 10 fathoms. Due to the large mesh of the dredge bag, the catch was necessarily large-size scallops.

Early in 1957 the Port Phillip beds received attention from underwater swimmers using aqualungs. Equipped with the heavier type of rubber suits, these swimmers have been able to visit the beds in May when the scallops are in their best condition. Two divers were able to gather 23 dozen scallops in one hour off Portarlington.

All this evidence would indicate that a small commercial fishery could be established in Port Phillip Bay, during the winter months, with a ready and expanding market available in Melbourne (Fisheries Newsletter, Australian Commonwealth Director of Fisheries, October 1957).

\* \* \* \* \*

**TUNA CANNING TRENDS:** The Australian tuna canning firm with packing plants at Eden and Narooma in the State of New South Wales has agreed to pay 5½d. a pound (about US\$102 a short ton) to the vessels that land tuna at ports as far north as Nowra. Deliveries to ports north of Nowra will receive 5d. a pound (about US\$93 a ton).

A mechanical shaper has been installed at the Narooma plant and other improvements have been made. The machine can handle both 7-oz. and 3½-oz. cans and should raise the production rate, and thus ease the pressure on the cold-storage facilities when catches are heavy.

About ½ ton of tuna was caught on September 3 for a trial run of the new shaper (Fisheries Newsletter, Australian Commonwealth Director of Fisheries, October 1957).



### Brazil

**OPERATIONS OF JAPANESE FISHERY COMPANY:** The Japanese fishery company that has been incorporated to operate in Brazil is gradually overcoming marketing difficulties by establishing distributing and processing facilities in Santos, and building its own depot. The venture has met some opposition from established Brazilian fishing companies, and the new Government warehouse at Santos has insufficient capacity for the Japanese company and other fishing companies. The problem of water supply will be solved by artesian wells.

Present plans call for processing fillets at the Santos plant and distribution by trucks to the city of Sao Paulo and other points in the interior. The fish will be marketed through supermarkets and 11 company-owned retail outlets. Due to a delay in the arrival of refrigeration equipment for the retail stores, the Japanese were granted permission by the municipal authorities to sell fish directly from the trucks.

The planned fleet of six Japanese vessels will be completed with the arrival on or about November 11 of a purse seiner and a tuna-fishing vessel (equipped with electronic devices) now on the high seas (United States Consul in Sao Paulo, October 30, 1957).

\* \* \* \* \*

**SARDINE SURVEY BY FAO REPRESENTATIVE:** Observations made with the help of an echo sounder-equipped commercial fishing boat indicated that the sardines kept close to the coast. Very few were noted more than 400 meters from the shore.

The head of the Norwegian Herring Investigation Section returned to Norway recently from a 17-month assignment as an advisor to the Brazilian Government on research in fisheries biology and to survey and appraise the marine fisheries resources on behalf of the Food and Agriculture Organization (FAO). Much of the work performed by the Nor-



wegian Scientist was concerned with the sardine schools off the coasts of Rio de Janeiro and Santos.

Both sardines and mullet were tagged during the assignment. The mullet tagged in the lakes of the Grande River migrate to the sea and move more than 2,000 miles northward along the Brazilian Coast. Two mullet were recovered as far north as Recife.



### Canada

**BRITISH COLUMBIA SALMON PACK, 1957:** The 1957 pack of canned salmon in British Columbia for the season ending in November amounted to over 1.4 million standard cases (48 1-lb. cans), the Canadian Department of Fisheries reported on December 4, 1957.

Table 1 - British Columbia Salmon Pack, 1952-1957

	1957	1956/	1955	1954	1953	1952
	(Standard Cases--48 1-Lb. Cans) . . . . .					
Sockeye (Red) . . . . .	227,436	320,096	244,821	680,718	510,147	449,494
Spring (King) . . . . .	12,571	11,671	17,853	14,080	13,049	9,279
Steelhead . . . . .	1,315	1,254	1,590	3,733	3,030	3,763
Blueback . . . . .	12,147	10,549	10,544	4,302	2,055	5,583
Coho (Silver) . . . . .	193,726	207,366	175,179	123,778	108,109	59,370
Pink . . . . .	751,048	363,633	831,253	335,550	794,764	679,182
Chum (Keta) . . . . .	245,024	203,710	124,860	580,575	394,113	91,886
Total . . . . .	1,443,267	1,118,279	1,406,100	1,742,736	1,825,267	1,298,557

1/-REVISED.

The total pack of canned salmon was 29 percent higher than the 1956 pack and was only 2 percent less than the average annual pack for 1952-1957. The pack of sockeye or red salmon continued to show a downward trend and was the smallest in the last six years. The pack of pink salmon for the cycle year was about up to expectations, but down about 9.6 percent from the previous cycle year of 1955. The silver pack was up 34 percent and the chum pack was down about 10 percent from the six-year average.

NOTE: ALSO SEE COMMERCIAL FISHERIES REVIEW, JANUARY 1957, P. 65.

\* \* \* \* \*

**MOBILE FISH INSPECTION LABORATORY:** A new mobile fish inspection laboratory was recently placed in operation in the Maritime provinces by the Canadian Department of Fisheries. The unit, a large truck-trailer assembly, is designed to provide rapid on-the-spot investigation where any unusual technological problems are encountered in fish and shellfish processing and packing.

The mobile laboratory, which is operated by the Department's Inspection and Consumer Branch, supplements the services provided by the fish inspection lab-



FIG. 1 - THE TRUCK-TRAILER ASSEMBLY WHICH HOUSES THE LABORATORY.

oratories at Halifax, N. S., Shediac, N. B., St. Andrews, N. B., and Charlottetown, P. E. I., and two small mobile laboratories.



FIG. 2 - THE CENTRAL WORK AREA SHOWING VARIOUS ITEMS OF EQUIPMENT.

The laboratory is housed in a large trailer resembling a furniture van. Every inch of its capacity--34 feet in length, 8 feet in width, and 11 feet 6 inches in height--is fully utilized in providing for the special appliances with which it is equipped and for working and storage space.

Among the larger fixed pieces of equipment are hot and cold water tanks, a pressure pump, generating plant, propane-gas storage tanks, refrigerator, autoclave, incubators, stove, sinks, and workbench. Added to these is a wide variety of specialized equipment such as is found in laboratories dealing in bacteriological analytical work.

Cabinet, cupboard, and storage fixtures and areas are designed in a manner to provide as much

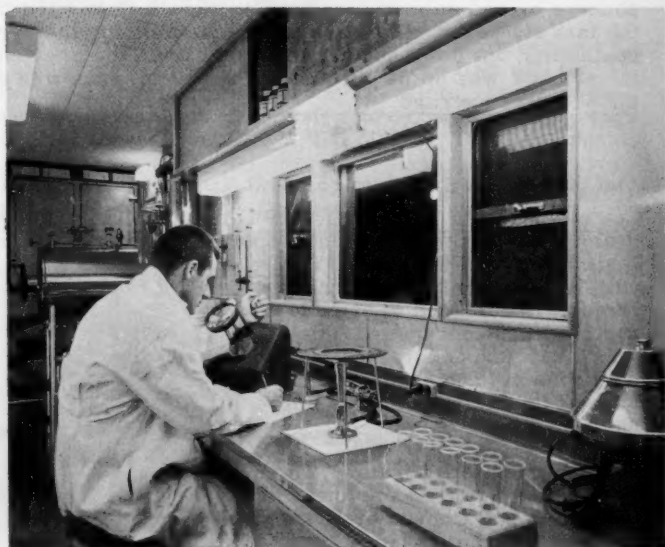


FIG. 3 - SCIENTIST CARRYING OUT CONTROLLED TEST OF FILLETS.

space of this nature as the interior will permit without overcrowding. The floor is covered with linoleum, the walls with plywood, and the ceiling with acoustic tile.



FIG. 4 - TECHNICIAN OPERATING AUTOCLAVE USED FOR STERILIZATION OF EQUIPMENT.

The walls and ceiling are fully insulated and adequate lighting is provided by the ceiling and wall fluorescent fixtures.

The electrical services, which utilize 100 volt 60 cycle A.C.-D.C. current, are capable of being operated from either an outside "hi-line" power supply or from the laboratory's own generating plant.

Similarly, the water supply for normal operations can be supplied to the laboratory's piping system by either an outside pressure source via a hose, or from the trailer's storage tank via an electric pressure pump. Motive power is provided

by a large truck-tractor which has a maximum carrying capacity of 22,000 pounds.

The mobile laboratory is based in Halifax, N. S., and will serve the entire Maritimes area. Its outstanding feature is that it will be able to provide a highly technical service to outlying areas in a matter of hours.



FIG. 5 - TECHNICIAN CONDUCTING TESTS TO DETERMINE THE PURITY OF WATER USED IN A LOBSTER-MEAT PLANT.

\* \* \* \* \*

**NEW FILMS ON SALMON AND POTHEAD WHALES:** Two documentary films dealing with fisheries have been produced recently by the National Film Board of Canada. One, The Salmon's Struggle for Survival, was made for the Federal Department of Fisheries, and shows graphically how a dilemma facing fisheries authorities in British Columbia is being met and overcome: the need, on the one hand, to use the swift-flowing waters of the Fraser and other rivers of the province for industrial and public uses and, on the other hand, to keep them uncontaminated and unobstructed so as not to impede the Pacific salmon in its annual migration to fresh-water spawning grounds.

Produced by the Film Board for a television series, the other documentary titled Encounter at Trinity shows the annual sea drama at Trinity Bay, Newfoundland, where in the summer and fall months herds of pothead whales are driven inshore by fishing boats and killed in shallow water. Whale meat makes excellent food for fur-bearing animals and this "fur fishing," as it is called, is supported largely by Newfoundland's growing mink ranch industry. The film explains all this and shows the actual round-up and killing of the potheads in several exciting and realistic sequences (Trade News of the Canadian Department of Fisheries, October 1957).

\* \* \* \* \*

**ONTARIO FISHERY LANDINGS FOR 1956:** Ontario's fishery landings of 60 million pounds in 1956 exceeded all past records, a news release dated December 3, 1957, from the Ontario Department of Lands and Forests states. The Lake Erie fishery, with near-record landings of blue pickerel or pike and white bass, and record landings of yellow perch, yellow pickerel or pike, and smelt, accounted for 75 percent of the 60-million-pound total landed in the Province.

Comparisons of the 1956 landings and ex-vessel values with past years show a relatively stable  $7\frac{1}{2}$  cents a pound average ex-vessel value from 1935-41. After 1941 ex-vessel prices increased gradually to an average of  $22\frac{1}{2}$  cents a pound in 1951. During this period, yearly landings remained fairly constant at an average of 31 million pounds yearly. During the 1935-51 period, the ex-vessel value increased from C\$2.5 million to \$7 million. From 1951 to 1956 landings increased from 31 million pounds to 60 million pounds in 1956, but the average ex-vessel price had decreased to  $13\frac{1}{2}$  cents a pound in 1956.

The Department of Lands and Forests draws the conclusion that the increase in landings has been due to increases in the catches of lower-priced species and this, coupled with a decline in catches of the more valuable species, has tended to keep the ex-vessel value of the catch almost static during the past six years.



### Cuba

**CLOSED SEASONS ON SNAPPERS AND CRABS ENDS:** The closed season on the fishing for gray snapper ("caballerote") and Cuban snapper ("cubera"), imposed on July 25, 1957, was terminated by the Cuban National Fisheries Institute effective October 15, 1957. Fishing for Morro or stone crabs (closed since July 15, 1957) was permitted effective October 31. The revisions in the closed seasons were published in the Official Gazette No. 211, dated October 16, 1957, states a November 4 dispatch from the United States Embassy in Habana.





## Denmark

**STUDIES ON LAUNCE TO BE EXTENDED:** Due to the growing importance of the landings of sand eel or launce ("tobis") for processing into meal and oil, the Danes have been making preliminary studies on races, lengths, ages, stage of maturity, and stomach contents since 1955 by analyzing market samples. In order to conduct further studies on this species, the Danish Fishing and Sea Researchers (Danmarks Fiskeriog Havundersogelser) announced in the periodical Borsen on October 22 that the Danish research ship Dana will work in the North Sea in the spring of 1958. Investigations to date have disclosed that there are five species of the genus Ammodytes under which launce falls, each with separate spawning habits. Previously only two species were known. The Netherlands is participating in the studies now under way on the launce and the English are conducting investigations in the Irish Sea near the Isle of Mann.

Plans for future work investigations on this fishery are not completed, but in general, the research is expected to include the following: (1) fishing experiments on different fishing grounds; (2) race, age, and length studies; (3) tagging studies with emphasis on internal tags; (4) feeding cycles and vertical movements between day and night; (5) escapement studies with various sizes of cod ends; and (6) stomach contents of sand eel predators (United States Embassy dispatch dated November 4, 1957).



## Ecuador

**CANNED SARDINE MARKET:** Production of sardines in Ecuador is so small that it has little or no effect on the quantity consumed, states a recent dispatch (October 1, 1957) from the United States Embassy at Quito. Within the past year an Ecuadorian company at Guayaquil has packed and marketed sardines under the name

Table 1 - Ecuador's Imports of Sardines-Salmon and All Marine Products, 1949-56

Year	Sardines <sup>1/</sup> and Salmon <sup>1/</sup>			All Marine Products		
	Quantity	f.o.b. Value		Quantity	f.o.b. Value	
	1,000 Lbs.	1,000 Sucres	US\$1,000	1,000 Lbs.	1,000 Sucres	US\$1,000
1956 <sup>1/</sup>	2,225	4,231	242	2,372	4,370	250
1955	2,177	4,979	284	2,347	5,478	313
1954	3,002	7,200	411	3,278	8,103	463
1953	1,903	4,657	266	3,117	7,946	453
1952	3,122	4,869	278	2,421	5,937	339
1951	3,154	5,533	316	3,289	6,012	344
1950	2,885	4,383	250	3,051	4,849	277
1949	1,685	3,312	189	1,871	3,966	227

<sup>1/</sup> PROBABLY ALL CANNED.

of "Parodi." Their product is aimed particularly at the medium- and low-income market. No information is available as to the pack; however, importers of canned sardines in Quito have reported that it is insignificant. Therefore, consumption is presumed to be equal to the quantity imported.

Imports of canned sardines and salmon (no separate figures are available) from all sources in 1956 amounted to approximately 2.2 million pounds valued f.o.b. at US\$241,811 as compared to 2.2 million pounds valued f.o.b. at \$284,548 in 1955 (see table 1). The imports of canned sardines and salmon in 1956 and 1955 comprised about 93 percent of the quantity of all marine products imported in each of those years. Approximately 98.1 percent in 1956 and 86.9 percent in 1955 of the quantity

of canned fishery products imported into Ecuador through Guayaquil were from the United States (see table 2).

The last available figures on the importation of sardines and salmon are for the first three months of 1957. Imports for the first quarter of 1957 amounted to 0.7 million pounds with an f.o.b. value of US\$89,999 as compared to 1.2 million pounds valued at \$146,091 for the first quarter of 1956. The level of imports of sar-

Table 2 - Ecuador's Imports at Guayaquil Only of Canned Fishery Products

Year	All Imports		From the U. S.		Percentage Imported from U. S.	
	Quantity	Value	Quantity	Value	Quantity	Value
	1,000 Lbs.	US\$1,000	1,000 Lbs.	US\$1,000	%	%
1956	2,184	271	2,225	279	98.1	97.1
1955	1,688	228	1,941	284	86.9	80.2
1954	2,466	339	2,650	371	93.0	91.4

dines and salmon during 1957 will probably be lower than in 1956. Importers claim that a rise in the cost of sardines, caused by the scarcity of this product is the principal reason for the decline of imports. The slight shift to the national sardine product by low-income purchasers may well have assisted this trend. Ecuadoran importers hope that once the situation in export centers becomes more normal, the volume of importation will again reach its previous level or even improve. Imported canned goods have a preferred status in the local market, and at the moment there is little danger of competition from domestic packs.

Of the canned sardines consumed in Ecuador, 95 percent are in 15-oz. cans and 5 percent are in 3 $\frac{1}{4}$ - to 5-oz. cans. Tomato is the medium of packing preferred by 95 percent of all consumers, and olive oil by the remaining 5 percent. Although sardines packed in natural brine are available, consumption of this type is so limited that it is not reflected in the percentages given.

Of the Ecuadoran sardine consumers, it is estimated that 70 percent are of the high-income level and that 25 percent and 5 percent are of the medium- and low-income levels, respectively. Sardines in 4 $\frac{1}{2}$ -oz. cans, packed in olive oil, sell for 4.00 sucres (23 U. S. cents) and those in 5-oz. cans, packed in brine, sell for 3.00 sucres (17 U. S. cents). An imported 15-oz. oval can of sardines packed in tomato sauce sells for 10.00 sucres (57 U. S. cents) as compared to a price of 8.00 sucres (46 U. S. cents) for a domestically-produced can of the same size and pack.

Sardines are imported into Ecuador by wholesalers who either sell directly to the public or who sell to retailers who in turn sell to the public. The Government of Ecuador does not purchase sardines.

NOTE: VALUES CONVERTED AT THE FREE MARKET RATE OF 1 SUCRE EQUALS US\$0.05714.



### German Federal Republic

**IMPORT TENDER FOR MILD-CURED SALMON:** An import tender for the importation of mild-cured salmon from the United States and Canada was requested by the West German Government on November 13, 1957. Applications for import licenses were to be submitted to the Foreign Trade Agency from November 18, 1957, until the value limit was reached, but not later than March 31, 1958. Products purchased for freely convertible currency must not be re-exported for currency not freely convertible. The value or tonnage limit was not disclosed and last day for customs clearance not announced.



### Hong Kong

**COMMERCIAL FISHERIES INDUSTRY:** Marine products, ranking first in importance among the Colony of Hong Kong's primary products, were valued at US\$7 million in the fiscal year ended March 1956. Fisheries are, however, of even greater significance to the economy of the Colony than this value would indicate. In addition to providing an above-average income and an important part of the dietary requirements for more than 56,000 fishermen and their families, the industry supplies much of the food needs of the entire Colony.

The fishing fleet consists of some 6,400 junk-type fishing craft of various sizes and 32 deep-sea trawlers. Almost 95 percent of the fishing fleet is owner-operated, the remainder belonging to fish dealers and fishing companies. Mechanization of the fleet is spreading, with 1,342 vessels at present motor-propelled and the rest sail-driven. The Government assists in the development of mechanization by allocating money from the Colonial Development and Welfare Fund for loans to fishermen, and private sources are also loaning money for the purpose.

An important new development has been the taking of shrimp on nearby grounds. These are landed fresh, quick-frozen, and most of them are shipped to the United States.



### Iceland

**NEW FREEZING PLANTS CUT INTO EXPORTS OF ICED FISH:** The need for fish supplies to support the two quick-freezing plants already completed and a third to be completed indicates that Iceland may soon cease to sell iced fish abroad. The first new quick-freezing plant was opened at Akueyri on Iceland's north coast in the summer of 1957. This was followed by a second plant at Hafaarfjaerdar, south of Reykjavik. The plant under construction is located on the northwest coast of Isafjordur.

Restrictions by the Icelandic Government are already in effect on the number of trawlers which can sell iced fish in England and East and West Germany. These restrictions are imposed to insure supplies for processing by the freezing plants. Due to restrictions on overseas sales, it is likely that Iceland will drop East Germany from the countries receiving fresh iced fish and England will very likely receive less.

The quota for iced fish vessels permitted to land at English ports in September was cut from 22 to 12, but actual arrivals amounted to only seven, the November 1, 1957, issue of The Fishing News states.



### Indonesia

**EXPLORATORY FISHING FOR SHRIMP:** The Indonesian Sea Fisheries Service is conducting exploratory trawling for shrimp along the east coast of Kalimantan with the research vessel Muna. The operations are being directed by a Canadian marine biologist assigned to Indonesia by FAO.

During April 1957, 36 tows were made in the region between Balikpapan and Kota Baru, at depths of 5 to 25 meters (16-82 feet). The best haul of about 220 pounds of good quality shrimp was made in a one-hour tow near Tandjung Maroeat, South of Balikpapan at a depth of 10 meters (about 33 feet).

The explorations are being continued and another research vessel Lollipop is soon to be commissioned for the purpose. (Indo-Pacific Fisheries Council Current Affairs Bulletin, No. 19, July 1957.)



### Japan

**EXPORT CONTRACTS FOR TUNA LOINS AND DISKS SUSPENDED:** Exporters of frozen tuna loins and disks have ceased to accept future contracts, state officials of the Japanese Export Frozen Aquatic Products Manufacturers Association. This suspension is apparently intended for a short period pending a study of new sales methods that are expected to be more satisfactory to both the exporter and the importer. Exports of loins and disks have been suspended since the latter part of October, reports a November 22, 1957, dispatch from the United States Embassy in Tokyo.

Firm contracts with importers in the State of Washington and in Puerto Rico for 900 tons will be met by the Japanese exporters.

It is beleived that this decision was suggested by the Government in order to meet complaints that Japan was exporting loins and disks only to selected areas in the United States, and thus discriminating against importers in other areas.

\* \* \* \* \*

**KNOTLESS FISH NET MADE FROM SYNTHETIC FIBER POPULAR:** A knotless net, made of rot-proof synthetic fibers, has become popular among Japanese fishermen, according to a paper by a representative of the Japanese manufacturer to the International Fishing Gear Congress in Hamburg in October 1957.

The firm, which invented the nets in 1922, claims remarkable merits for them, and says they may eventually replace ordinary nets in Japan.

Pointing out that an ordinary net cannot be made without knots, the paper describes the making of the knotless net by a doubling process in which several single yarns are doubled together without twist by a machine.

Two or more of these doubled yarns are then again doubled and twisted into a strand in "Z" direction. This strand is then wound on the bobbin of the netting machine.

Twine in the knotless net has an "S" twist of two-ply strands.

Special features of the knotless net include lighter weight and less bulk since as much as 50 percent of raw material can be saved; higher strength; less resistance to currents; easier to handle and no friction; less labor and smaller tackles; no damage to the fish; mesh size almost 100 percent exact; easier and more complete dyeing; and less adherence of dirt and microbes.

By a heat-setting process, the "S" twist in the twine is fixed in position and the twine becomes stronger by about 15 percent. Also, hard fibers become soft and soft fibers can be given suitable hardness.

Nets of nylon and similar yarns are dyed with commercial dyes, pigment colors, or coal-tar.

\* \* \* \* \*



**TUNA RESOURCES OF THE EQUATORIAL ATLANTIC:**<sup>1/</sup> Some study of the tuna resources of the Atlantic Ocean has already been done in the United States, but it has been extremely limited in area and amount and is inadequate for the information of the Japanese fishing boats, which recently have been advancing in some numbers into the Atlantic.

Therefore, the authors, having obtained some interesting results from an analysis of the reports

of the Kanagawa Prefecture Fishery Experiment Station's vessel *Sagami Maru*, present this report in the hope that it may be of value to fishermen. The report covers, however, the results obtained from only a small amount of data, and it is possible that it will need correction in the future as more data accumulate. Further reports will be published as the need for such corrections arises. Furthermore, in any area there is a decline in catch rates when an unexploited fishing ground is first fished, and this point must be borne in mind until the catches become stabilized. In the present report the catch rate has been used to compare the density of distribution.

It is planned that from now on this Station will compile and publish data from the Atlantic according to the geographical divisions shown in figure 1.

**Yellowfin Tuna:** Catch rates for the various areas of operation are shown in figure 2A for winter and in 2B for late spring.

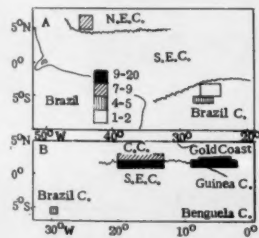


FIG. 2 - YELLOWFIN CATCH RATES IN THE EQUATORIAL ATLANTIC OCEAN-- (A) FOR THE WESTERN AREAS IN WINTER, AND (B) FOR THE EASTERN AREA IN LATE SPRING. (A) AND (B) HAVE THE SAME MEANING IN THE SUBSEQUENT FIGURES.

In winter, in the north equatorial current there is a considerable catch of this species, with a catch rate of 7.64 fish per hundred hooks, but the rates are lower in the Brazil current, 5.30 having been recorded in December at 5°-6° S. latitude, 25°-28° W. longitude, and in February-March at 3°-5° S. latitude, 24°-27° W. longitude, it was down to 1.54. In late spring the south equatorial current area had the highest rates, over 10.0, with

an especially high figure of 19.95 at the boundary between the south equatorial current and the Guinea current. The Guinea current area was next, with 7.8-11.9, while the equatorial countercurrent, with 7.0, had about the same rate as the north equatorial current in winter. On the other hand, the Brazil current area had 4.32, about the same rate as in December and much lower than the other areas.

From these facts it can be deduced that in both winter and late spring the south equatorial current area has the highest catch rates, followed by the north equatorial, the countercurrent, and the Guinea current, which are likewise high, while the Brazil current area has the lowest rates. It can also be deduced that in the Brazil current August-October is the best fishing season and February-March is the off-season. However, in order to come to any conclusions we need data from summer to fall, and the foregoing deductions are still uncertain.

**Big-eyed Tuna:** The winter catch rates are shown in figure 3A and the late spring ones in 3B.

In winter the catch rate in the north equatorial current was 0.61 fish per hundred hooks and in the Brazil current it was 0.46 in December and 0.52 in February-March. In late spring the south equatorial current had rates of 0.27-0.34, the countercurrent had 0.18, the Brazil current had 0.13, and there were no catches of big-eyed in the Guinea current area.

Consequently it is deduced that the species does not occur abundantly in the Guinea current, that in the Brazil current the good season is in winter and the off-season in summer, and that the seasonal picture for the north and south equatorial currents is the same as for the Brazil current, with better fishing in the north equatorial than in the south equatorial current. Further, whereas yellowfin and albacore catch rates are generally higher than in the equatorial Pacific, big-eyed catch rates are considerably lower.

**Albacore Tuna:** Winter albacore catch rates are shown in figure 4A, late spring catch rates in 4B.

In winter the Brazil current area had high rates, 9.28 fish per hundred hooks in December and 9.12 in February-March. The north equatorial current showed a low rate of 1.82. Late in the spring the south equatorial current had 1.3-2.6, the Guinea current area

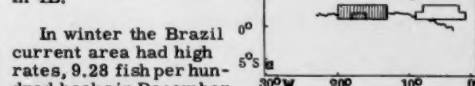


FIG. 4 - ALBACORE CATCH RATES (NUMBER OF FISH PER HUNDRED HOOKS).

<sup>1/</sup> TRANSLATED BY W. G. VAN CAMPEN, PACIFIC OCEANIC FISHERY INVESTIGATIONS, FROM AN ARTICLE BY MITSUO NAGAI AND ATSUSHI NAGAGOME, KANAGAWA PREFECTURE FISHERIES EXPERIMENT STATION (TUNA FISHING, NO. 42, 1957, PP. 21-26).

was very low, with 0.20-0.74, while the Brazil current area had 2.47.

Consequently, it can be deduced that in the Brazil current area the winter is the good fishing season, and the summer is the off-season. In winter the north equatorial current offers far lower catch rates than the Brazil current, but in late spring the south equatorial, the counter-current, and the Guinea Current have about the same rates as the Brazil current. These areas also appear to have seasonal changes, but nothing certain is known about them.

FIG. 5 - BLACK MARLIN CATCH RATES (NUMBER OF FISH PER HUNDRED HOOKS).

Winter catch rates are shown in figure 5A, late spring catch rates in 5B.

In winter the Brazil current area had a catch rate of 0.62 fish per hundred hooks in December and 0.95 in February-March, while the north equatorial current had 0.42. In the late spring the south equatorial current and the Guinea current had rates of 0.41-0.56, the countercurrent had 0.32, and the Brazil current had 0.23.

Thus the Brazil current area had better fishing in winter and poorer in summer. If it is assumed that there is a north-south migration like that of the Pacific, it can be deduced that the north equatorial current area will have poor fishing in winter and good fishing in summer. If there are seasonal changes in the south equatorial current area, they are probably slight.

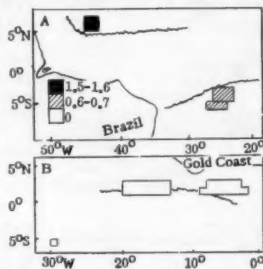


FIG. 6 - STRIPED MARLIN CATCH RATES (NUMBER OF FISH PER HUNDRED HOOKS).

**Striped Marlin:** Winter catch rates are shown in figure 6, late spring rates in 6B.

In winter, the catch rate is highest in the north equatorial current, with 1.52 fish per hundred hooks; the Brazil current area is somewhat lower but still high, with 0.68 in December and 0.61 in February-March. In late spring there was no catch except in the north equatorial current.

Thus, although the situation in the south equatorial current is unknown, in the other areas there are large seasonal variations, and it appears that the Brazil current area offers good fishing in winter.

**Sailfish:** The winter catch rates are shown in figure 7A, the late spring catch rates in 7B.

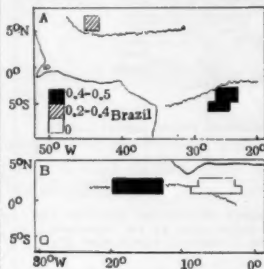


FIG. 7 SAILFISH CATCH RATES (NUMBER OF FISH PER HUNDRED HOOKS).

In general the differences among the areas are small, but no sailfish were taken at all in the Guinea current and in the Brazil current in spring; seasonal variation can be detected in the Brazil current area.

**Summary:** Yellowfin are abundant in the north and south equatorial currents, the equatorial countercurrent, and the Guinea

current, and scarce in the Brazil current. Big-eyed are not present at all in the Guinea current, but occur generally in the other current systems. Albacore are plentiful in the Brazil current; the situation is not known in the north equatorial current; in summer there are very few in the Guinea current. Black marlin are extraordinarily abundant in the Brazil current area in winter. Not much is known of striped marlin in the south equatorial current, the countercurrent, and the Guinea current, but they are very abundant in winter in the north equatorial current and the Brazil current. Sailfish have about the same distribution as big-eyed. Seasonal variations are seen in each species, but it is especially interesting that the variations in the Brazil current area show the same trends as those seen in the Solomons area of the Pacific at 0°-5° S. latitude, 170°-180° E. longitude.

JAPANESE GOVERNMENT



Korea

**TRIAL SHIPMENTS OF FROZEN SHRIMP AND TUNA TO UNITED STATES:**  
The South Korean fishing industry is preparing two frozen shrimp shipments and one frozen tuna shipment for the United States.

Introduction of shrimp trawling equipment, instruction in construction of shrimp trawls, demonstration and instruction in the use of trawls on existing vessels have been the major activities of Office of Technical Cooperation fisheries technicians during November 1957. A second trawl project, in cooperation with a private fishing company, has been initiated near the Pohang area. No conclusive results have yet been obtained because the "shrimp run" is late in starting this year.

A Diesel engine training school at the Fisheries Experiment Station, Pusan, sponsored by the Korean Office of Marine Affairs, is training 19 students in the actual installation, operation, maintenance, and repair of Diesel engines. At least two classes are planned to train Korean instructors who will then teach courses for fishermen in the fishing ports throughout Korea, according to a report of December 5, 1957, from the Office of Technical Cooperation in Seoul.



### Mexico

**MAZATLAN SHRIMP INDUSTRY REPAIRS STORM DAMAGE:** The hurricane which hit the Mazatlan shrimp fishing port on October 22, 1957, resulted in the sinking or beaching of 57 vessels. Of these, 22 vessels are reported to be a total loss and as of November 13, 35 percent of the fleet was still inactive due to storm damage. Previous reports had stated that 40 shrimp trawlers were totally destroyed and 36 seriously damaged.

Among the shrimp vessels beached or sunk 12 are now back in operation. The major shipyard in Mazatlan was still blocked by a grounded Mexican Coast Guard boat.

A delegation from the Mazatlan fishing industry was received by the President of Mexico in Mexico City and instructions were issued to the Banco de Mexico to accept for discount 10 million pesos (US\$800,000) in five-year loan notes. As the loans will be made against collateral, only the largest producers will be able to avail themselves of the aid, a November 13, 1957, dispatch from the United States Consul in Nogales reports.

\* \* \* \* \*

**MERIDA SHRIMP FISHERY TRENDS, JULY-SEPTEMBER 1957:** The east coast Mexican shrimp fishing industry operating from the Merida area exported close to 5 million pounds of shrimp during July-September 1957. Brown shrimp prices at Brownsville, Tex., for 15-20 count headless were 96 U.S. cents in July, 93 cents in August, and dropped to 80 cents in September.

The operators of more than 300 fishing vessels belonging to the fishing cooperatives in Ciudad del Carmen, after first protesting the Government order to register for Social Security, finally complied.

Exports of fish other than shrimp during the quarter totaled 40,000 pounds. All exports were made to the United States, states an October 30, 1957, dispatch from the United States Consul in Merida.

\* \* \* \* \*

**SPINY LOBSTER REGULATIONS REVISED:** Revised Mexican regulations provide for a new method of measuring live spiny lobsters to determine legal size, open and closed seasons, and prohibiting the export of live spiny lobsters. The regulations became effective on October 9, 1957, upon publication in *Diario Oficial*.

The closed season for spiny lobsters (*Panulirus interruptus* and *P. inflatus*) occurring in the Mexican territorial waters of the Pacific Ocean and the Gulf of California, and *Panulirus argus* occurring in the territorial waters of the Gulf of Mexico, shall be from March 16 to September 30, both dates inclusive. Previous regulations had provided, for a limited time, a closed season in the Gulf of California between N. latitude 23° and 29° from April 16 through October 31. In addition, the new regulations empower the Ministry of Marine

to determine refuge zones and to fix the zones that may be indicated as nursery grounds.

The minimum legal size for lobsters shall be 82.5 millimeters (3.25 inches). Measurements are to be made along the midline of the shell of the carapace from the interocular space to the posterior edge. The capture, possession, transportation, and sale of undersize spiny lobsters is prohibited. The change in this regulation was made to bring Mexican methods of measurement into line with those now in use in California. As most of the Mexican west coast catch of spiny lobsters is exported to California, the new regulation does away with the necessity of two sets of measurements to meet the regulations of both California and Mexico. The system now in use is subject to less variation and the measurements can be made more readily. No provision was made in the

new regulations for a maximum legal size which formerly was 400 millimeters (15.75 inches).

Spiny lobsters may be taken by any method, which in the judgment of Ministry of Marine, does not prejudice the conservation of the species. This provision is designed to cover the possibility of commercial diving for spiny lobsters. Studies have indicated that divers using aqualungs are much more efficient than the conventional traps. Also, trap-caught egg-bearing females and undersized spiny lobsters shall be returned to the sea in the best possible condition.

All traps and other equipment used for catching spiny lobsters must be out of the water and away from the fishing grounds by the end of the last legal fishing day.

The exportation of live lobsters is prohibited. Previous regulations permitted only the exportation of cooked lobsters. The law now permits the export of uncooked and frozen spiny lobster tails. At the present time this is not important in the trade with California since the bulk of the exports from Lower California are in the form of iced cooked whole spiny lobsters. It may, however, assist in the development of an export trade in frozen spiny lobster tails from the east coast of Mexico.

\* \* \* \* \*

**TUNA PACKING PLANT IN VERACRUZ PROPOSED:** A fish packing plant may be established in Veracruz, Mexico, due to the discovery of a yellowfin tuna resource in the Gulf of Mexico about 60 miles offshore of that port. There is some question as to the extent of the tuna resource, both quantitatively and seasonally, states a November 6, 1957, dispatch from the United States Consul at Veracruz.



#### Morocco

**FISHING INDUSTRY INCREASES IN IMPORTANCE:** The Moroccan fishing industry has been becoming increasingly important to the nation's economy in recent years. In 1956 about 110,000 metric tons of fishery products were landed by the commercial fishermen. At the present time there are 200 fish canneries engaged primarily in the canning of sardines. Production of canned sardines amounted to about 70,000 tons in 1956. Most of this sardine pack is exported.



#### Netherlands

**NEW INDUSTRIAL FISHERY FOR LAUNCE:** Although before the last war the Netherlands had a fishery for scrap or unutilized fish for the fish meal industry, it was a surprise when at the end of May 1957 some small Dutch cutters started an industrial fishery for launce or sand eel. During May and June the greater part of the Dutch cutter fleet is usually fishing in the German Bight for sole. But the landings of sole were well over 30 percent below normal. It was understandable that many fishermen were searching for better catches, and that about 44 vessels finally entered the industrial fishery for launce or sand eel (*Ammodytes marinus* raitt).

The Dutch fish meal plants were not adapted to the rapidly increasing supply of sand eel and in the middle of July the landings were sharply restricted by the fish meal plants. But this measure coincided more or less with the end of the fishery as a very sudden decline of the catches during the second half of July made a further industrial fishery for sand eel near the Dutch coast impossible.

The total landings were 5,800 metric tons of sand eel, of which one third was landed by 54 Norwegian and German fishing vessels. A large fleet of Danish cutters was fishing together with the Dutch cutters, but they were not allowed to bring their sand eels to the Dutch ports.

In July the Dutch fishermen were obliged by the fish meal plants to preserve their catch with sodium nitrite.

The most remarkable fact about this fishery was the discovery of new fishing grounds near the Dutch coast. Probably discovered by Norwegian trawlers, the fishing area was further explored by Dutch and Danish fishermen. Beginning in the vicinity of the Isle of Texel, the area was extended along the Dutch shore between 8 and 25 miles from the coast seaward, down to the Zealand isles. This area is well known as a fishing ground for small cutters, yielding mostly moder-

ate quantities of flatfish and whiting. It was never thought that such immense quantities of sand eels could be caught so near the coast.

Another remarkable fact was the selectivity of the nets for sand eels. The catch consisted almost entirely of sand eels (*Ammodytes marinus*), with less than 1 percent of *Ammodytes lancea* and *Ammodytes lanceolatus*. Occasionally some mackerel, horse mackerel, a few whiting, and greater weever were caught with the sand eels, but always less than 10 percent of the total catch. Some foreign vessels landed up to 40 percent of other species, but never undersized fish in any quantity.

The sand eel was caught in two colors--specimens with bluish backs and specimens with brown-yellowish backs. Vertebrae countings showed that both varieties belonged to *A. marinus* and not, as is sometimes stated, the bluish variety to *A. marinus* and the brown-yellowish variety to *A. lancea*.

The poor catches of sole during last spring were attributed by many Dutch fishermen to the industrial fishery for sand eel in the German Bight, and these fishermen were annoyed about the new Dutch fishery for this species. Although the sand eel in different stages of its life is undoubtedly an important food for fish, biologists believe that the fishery would not yet seriously harm the food situation for other species in the North Sea.

Shortly after World War II the quantity of fish in the North Sea was much larger than now. Nevertheless the growth rate of all economically-important species was practically the same as now. This indicates that at that time there was enough food for a more dense fish stock so that now there must be a surplus of food.

There is a possibility that some species such as whiting and haddock will switch over from sand eel to young herring



in certain seasons. But tarbut, sole and the greater weever will still feed on bottom invertebrates.

An industrial fishery is worthwhile only when large quantities are caught within a short time. When the density of the sand eel stock is reduced too much by the fishery, there will no longer be a possibility for industrial fisheries, and a good deal of the stock will remain untouched.

To study the relative importance of the sand eel in the food spectrum of different fishes, commercial trawlers collected stomachs of many species for the biologists. This program was begun at the end of the sand eel fishery. Since then 1,000 stomachs of sole, plaice, tarbut, whiting, haddock, and cod were examined: only in the large soles of about 40 cm. (almost 16 inches) were any quantities of sand eel found. On the other hand fishermen indicated that they sometimes found that 10 percent of the weight of their catch consisted of sand eel contained in the stomachs of the gutted fishes. These are observations made during the fishery for sand eel: possibly the sand eel is catchable for man as well as for predator fish only during a short period?

The program of investigations for sand eels includes:

1. The position of the sand eel in the food chain of the sea will be studied in greater detail. Stomachs of sand eel were examined: all the common species of copepods and cladocera were found up to a size of 1.5 mm. (*Pseudocalanus*, *Paracalanus*, *Temora*, *Podon*, *Evdadne*). No phytoplankton was found, neither nauplii. A few fish eggs (anchovy) and polychaete larvae could be detected. It was found that most of the stomachs were empty during the early morning, whereas in the afternoon and evening the stomachs were well filled. Probably the catchability of the sand eel (only fished during the day) depends on the feeding behavior of this species.

Plankton samples taken during the fishery for sand eel showed roughly the same composition as the stomach con-

tents of the sand eel. The sudden disappearance of the sand eel from the fishing grounds is presumably connected with the changes in abundance and the behavior of the plankton.

2. Little is known of the behavior of the sand eel. Does it migrate during certain seasons? Does it show a daily vertical migration? Does it burrow itself into the sandy bottom? Does it attach its eggs on the bottom or in the bottom? etc. Many of these problems have a direct bearing on the fishery and on the influence of this fishery on other species. Probably some aspects of this behavior can be studied by means of echograms on which the sand eel concentrations are plainly visible.

3. Growth and propagation are being studied. Otoliths are easily readable. Most of the sand eels caught were in their first or second year, only a few in their third year. The size of the sand eel varied between 13 and 23 cm. (5-9 inches) with a majority 17 cm. (6.7 inches). All sand eel studied were immature. It is intended to keep sand eel in an aquarium to study their propagation and other problems.

4. The main problem is: will or can this fishery continue, and if so how much of the stock can be caught without diminishing seriously the food supply for fish in the North Sea? This year the fishery for sand eel was a welcome one because it partly relieved the heavily-fished stocks of other commercial species. In this connection 15 percent of the Dutch cutter fleet fished sand eel. But the future is uncertain. It is a bad sign that the large fleets of German and Danish cutters did not catch enough sand eel in the German Bight this year, but that they all concentrated near the Dutch coast. Is the stock of sand eel declining so rapidly?

It is interesting to note that shortly after the end of the fishery described, very good catches of sole were recorded on the same grounds where some weeks before hundreds of tons of sand eel were caught. (From a paper presented at a meeting of the International Council for the Exploration of the Sea, by M. Roessingh.)



## Norway

**HERRING BEHEADING AND GUTTING MACHINE SUCCESSFUL:** During the past two years a Norwegian manufacturing concern in Bergen, Norway, has been working on the development of a herring beheading and gutting machine. This machine is of special interest to the Norwegian fishermen fishing for herring in Icelandic waters where the herring is salted aboard the vessels.

The three main parts of this equipment are the conveying belt, the circular knife, and the suction wheel.

The herring are placed in pockets arranged on the conveying belt, and pass by the rotating circular beheading knife. The suction wheel has a hole for each pocket on the conveying belt, and each hole is connected with a piston suction device. This arrangement is synchronized. When the beheaded herring pass the suction wheel, the suction device sucks the entrails out of the herring.

The machine has a capacity of 30 barrels of beheaded and gutted herring an hour. After some training, two men can

handle the machine. A watertight 3-horsepower motor drives the machine. The machine, which may be washed while operating, is operated by means of strong chains, chain wheels, and worm gear. All shafts have ball bearings with watertight packings.

Total length of the conveying belt is 2.5 meters (about 8.2 feet). The machine itself is 0.8 meters high (2.6 feet), 0.9 meters (3.0 feet) wide, and 0.9 meters long. The conveying belt may be locked by means of two screws, dismantled in the course of 2-3 minutes and stowed away, which is essential on small vessels.

The machine is thoroughly tested. During two seasons it has been tried on board the Norwegian research vessel *G. O. Sars*. Last season 4 such machines were in use on fishing vessels during the herring fishery in Icelandic waters. The machines worked smoothly.

The machine has been designed on a principle invented by the Chief Engineer aboard the *G. O. Sars*. Production of the new equipment has now been started.



## Panama

**BAIT FISHING BY TUNA CLIPPERS PERMITTED NOVEMBER-JANUARY:** In a decree (No. 83) dated November 7, 1957, the Panamanian Government provisionally permitted the taking of anchovies ("anchoveta") for bait by tuna clippers during the months of November and December 1957 and January 1958. For the past few years this three-month period has been a closed season for this species. The new decree provided for a fee of US\$4.00 a net ton of registered length for foreign vessels desiring to take bait in Panamanian waters during this three-month period. This

amount was in addition to US\$11.00 a net ton of registered length charged during the regular open season from February 1-October 31 (United States Embassy in Mexico dispatch dated November 18, 1957).



### Philippines

**EXPERIMENTS WITH TUNA PROCESSING:** Experiments on the processing of tuna for commercial use were recently commenced by the Philippine Bureau of Fisheries. Heavy tuna catches by the M/V David Star Jordan, operating under the guidance of an FAO fishery expert, stimulated these experiments. The fish used in the experiments came exclusively from the catches of this research vessel.

The various canned packs tried were solid pack in brine and oil, and flakes in oil. Development of (1) tuna viscera-rice bran, (2) tuna scrap meal, and (3) tuna glue as possible byproducts of the tuna-processing industry were also considered.



### Portugal

**CANNED FISH EXPORTS, JANUARY-SEPTEMBER 1957:** For the first nine months of 1957, canned fish exports amounted to 36,424 tons, valued at US\$22.2 million. Sardines in olive oil exported during the first nine months of 1957 amounted to 23,284 tons, valued at US\$14 million (Conservas de Peixe, November 1957).

During January-September 1957 the leading buyers of canned fish were: Italy, 7,007 tons (valued at US\$4,164,000), Germany, 5,413 tons (US\$3,237,000), Great Britain 4,050 tons (US\$2,380,000), the United States 3,267 tons (US\$2,746,000), and France 2,311 tons (US\$1,449,000). These countries purchased 74.4 percent of the quantity and 68.3 percent of the value of all Portuguese exports of canned fish. Exports of sardines in olive oil for the first nine months of 1957 to the United States amounted to 1,464 tons (valued at US\$1,167,000), and 1,354 tons of anchovies (valued at US\$331,000).

Portuguese Canned Fish Exports, January-September 1957		
Product	January-September 1957	
	Metric Tons	US\$
Sardines in olive oil . . . . .	23,284	14,003
Sardinelike fish in olive oil . . . .	4,139	3,184
Sardines & sardinelike fish in brine . . . . .	1,159	288
Tuna & tunalike in olive oil . . . .	2,193	1,753
Tuna & tunalike in brine . . . . .	355	207
Mackerel in olive oil . . . . .	4,558	2,383
Other fish . . . . .	736	340
Total . . . . .	36,424	22,158

\* \* \* \* \*

**CANNED FISH PACK, JANUARY-JULY 1957:** The total pack of canned fish for January-July 1957 amounted to 23,306 tons as compared with 10,781 tons in the similar period of 1956. Canned sardines in oil (7,519 tons) accounted for 32.3 percent of the January-July 1957 total pack, much higher than the pack of 3,258 tons for the same period in 1956. For the first 7 months of 1955 the total pack of all canned fish amounted to 14,976 tons (9,076 tons sardines in oil).

Portuguese Canned Fish Pack, January-July 1957		
Product	Net Weight	Canners' Value
	Metric Tons	US\$
<b>In Olive Oil:</b>		
Sardines . . . . .	7,519	5,731
Sardinelike fish . . . . .	7,644	3,711
Anchovy fillets . . . . .	1,755	1,757
Tuna . . . . .	1,277	915
Other species (incl. shellfish) . . . .	475	292
<b>In Brine:</b>		
Sardinelike fish . . . . .	4,169	1,069
Other species . . . . .	467	103
Total . . . . .	23,306	13,578

The Portuguese pack of canned sardines in oil totaled 2,393 metric tons during July 1957. The pack of all canned fish in July 1957 amounted to 8,826 tons, the November 1957 Conservas de Peixe reports.

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**FISHERIES TRENDS, SEPTEMBER 1957: Sardine Fishing:** During September 1957, the Portuguese fishing fleet landed 13,093 metric tons of sardines (valued at US\$1,340,000 ex-vessel or \$102 a ton). In September 1956, a total of 19,883 tons of sardines (valued at US\$89 a ton) were landed.

Canneries purchased 45.4 percent or 5,944 tons of the sardines (valued at US\$735,860 ex-vessel or \$124 a ton) during September. Only 42 tons were salted, and the balance of 7,107 tons, or 54.3 percent of the total, was purchased for the fresh fish market.

Matosinhos lead all other ports in September landings of sardines with 7,183 tons or 54.9 percent, followed by Setubal 2,205 tons (16.8 percent), and Peniche 1,756 tons (13.4 percent).

Other Fishing: The September 1957 landings of fish other than sardines consisted of 65 tons (value US\$7,200) of anchovy, 3,224 tons (value US\$217,704) of chinchard, 305 tons (value US\$54,296) of tuna, 17 tons of bonito (value US\$3,235), and 2,241 tons of mackerel (value US\$119,478). (Conservas de Peixe, November 1957.)



### Surinam

FISHING INDUSTRY EXPANDS UNDER TEN YEAR PLAN: The fishing industry of Surinam (Dutch Guiana), under the stimulus of a Ten Year Plan, showed continuing progress in 1956. Catches of fish and shellfish rose to about 7.3 million pounds in 1956 as compared with 5.5 million in 1955, and 4.0 million in 1954. The increase in 1956 was due largely to the Government's system of leased fish farms on reclaimed plantations.

The increased catches led to a sharp increase in the consumption of fish meal by the recently-emerging local poultry and cattle feed industry. At the same time, the importation of fish meal showed a significant decline. In 1955, annual imports were valued at Sf 276,000 (US\$146,000). In 1956, they dropped to Sf 243,000 (US\$129,000). Local production of fish meal in 1956 amounted to 36 tons. During 1957 production of 100 to 110 tons of fish meal is predicted.

A new, modern shrimp-processing and freezing plant opened in 1956. One major shipment of about 35,000 pounds of frozen cooked, and peeled shrimp (sea bob) was made to the United States. Shrimp catches, however, were erratic. The Government was concerned about this matter and by the end of the year had signed a contract for an offshore shrimp survey using a modern trawler from the United States.

There are now fishing stations at Coppename Point, Paramaribo, Alliance, and Albina. Work on a new station at Nickerie started in 1957. Work continued on increasing the freezer capacity of the station at Coppename Point. Considerable progress was made on the construction of a new fish station at Alliance. The stations include an electric plant (except at Paramaribo); refrigeration space; storage and processing sheds; and housing (except at Paramaribo) for the families of the fishermen. For the most part, funds from the Ten Year Plan were used.



### Thailand

EXPERIMENTS WITH FISH FLOUR AS PROTEIN SUPPLEMENT: About 600 people in the village of Nongkorn in the Ubol Province of Thailand recently took part in an experiment that may have a radical effect upon the diets of this particularly protein-hungry part of Thailand. Under the supervision of Food and Agriculture Organization (FAO) nutritionists, members of 150 families received a daily ration of 15 grams (about  $\frac{1}{2}$ -oz.) of fish meal in an effort to supplement their meagre intake of protein, usually only available in the form of fermented fish.

The experiment was carried out by trainees of the Thailand-UNESCO Fundamental Education project, who hope eventually to qualify as social and educational workers in the fight to raise the living standards of the country's villagers. People receiving the flour were given instruction in its use along with simple recipes supplied by the Government's Health Department.

The flour, which also is a good source of calcium, is produced at Chumporn, 468 miles from Bangkok by the Fish Marketing Organization, and is made from "platu" and some "slipmouth" fish. The factory can turn out about 28 tons of fish into 5 tons of flour every day and can use the smaller fish which previously had little or no market.

Originally fish flour was thought of only as food for poultry, but nutritionists, realizing its high protein content, checked the manufacturing process and found that it was in every way suitable for human use.

The main reason for the experiment was to test the acceptability of the flour among the village population. The Thai Department of Fisheries has indicated that if the experiment is a success the flour will be made available to all the villages of the province (FAO Bulletin No. 2, 1957).

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**SHRIMP PACKING COMPANY ESTABLISHED IN THAILAND:** A joint Thai-United States Company has been formed to catch, process, and freeze shrimp from the Gulf of Thailand. A factoryship, equipped with modern freezing devices, is expected to arrive in Bangkok early in 1958. The vessel, owned by a firm incorporated in Panama, will employ about 150 Thais in the processing of the shrimp and has a storage capacity of about 1,100 metric tons. The new company hopes to process 5 million pounds of shrimp in its first year of operations. A United States firm has guaranteed to purchase the entire pack, according to a November 15, 1957, dispatch from the United States Embassy in Bangkok.



### U. S. S. R.

**RAPID EXPANSION IN FISHING FLEETS FROM 1938 TO 1956:** For the first time the Soviet Union has released figures on the composition of its fishing fleets. Figures released in the Food and Agriculture Organization's Yearbook of Fishery Statistics 1955-56 (Vol. VI) indicate that Russia's total number of powered fishing

Table 1 - Composition of Soviet Union's Fishing Fleets, 1938, 1948, 1954-56

Category	Unit	1956	1955	1954	1948	1938
Powered craft: . . . . .	Number	12,387	10,872	9,925	3,158	2,727
	Horsepower	982,600	834,200	725,300	243,200	123,900
Trawlers . . . . .	Number	1,785	1,598	1,379	329	107
	Horsepower	549,300	451,800	362,400	88,000	62,500
Seiners . . . . .	Number	1,724	1,517	1,395	407	376
	Horsepower	225,700	194,200	175,800	29,200	18,900
Other . . . . .	Number	8,878	7,757	7,151	2,422	2,244
	Horsepower	207,600	188,200	187,100	126,000	42,500
Non-powered craft: . .	Number	48,056	47,752	45,912	41,174	33,679
	Tonnage	127,400	126,100	125,800	83,300	103,600
Total All Craft . .	Number	60,443	58,624	55,837	44,332	36,406



craft has increased close to 454 percent since 1938 (2,727 in 1938 as compared with 12,387 in 1956). The increase in horsepower, which is often a better indicator of catching capacity, has been even more pronounced with an increase of close to eight-fold. The increase in the number of nonpowered craft was not so pronounced (33,679 boats in 1938 as compared to 48,056 boats in 1956, or about 43 percent). The sharp increase in the number and horsepower of powered vessels is a measure of Russia's capacity to exploit productive distant fishing grounds as distinguished from the over-exploited inshore banks, lakes, and rivers to which nonpowered craft are limited.



### Union of South Africa

**FISH FLOUR USED AS PROTEIN ADDITIVE IN BREAD:** After four years of research, South African scientists claim to have perfected a process by which fish flour is now made completely tasteless and odorless.

It is being supplied to bakers by the South African Department of Nutrition for use in fortified brown bread. All bread in the Union is subsidized, but to encourage the consumption of this bread, which has been named "Bremer bread" in honor of a former Minister of Health, an additional subsidy is given. This enables a 2-pound loaf to be sold at 7d. (about 8 U. S. cents) as against 9-1/2d. (about 11 U. S. cents) for a white loaf. Since the introduction of "Bremer" bread, the demand for brown bread has increased by 12 percent.

The National Nutritional Research Institute of South Africa points out that the flour when added to the protein already in the bread has the effect of increasing the biological value of the existing protein content.

The loaf contains about two percent fish flour and, when the scheme is fully operative, 5,000 tons of fish flour a year will be required.

The raw material for the flour consists of commercial fish meal or press-cake prepared from small fish. The process involves the following steps:

(1) The crude meal is extracted with a solvent mixture consisting of 90 percent of industrial ethyl alcohol of 96 percent strength and 10 percent ethyl acetate.

(2) Five or more extractions are carried out, until the drained solvent appears colorless. Each extraction takes 20 minutes at the boiling point (approximately 180° F.) of the solvent. The ratio of solvent to meal is about 2.5:1 by weight.

(3) Each extraction is followed by a 1:1 wash with clean solvent.

(4) After extraction the flour is completely freed from all traces of solvent by drying in hot air or by vacuum (with or without the aid of "steam stripping").

The fish flour produced by this process has a light brown color and is free from the effects of heating. It is neutral and, in particular, is absolutely free from all fishy or other foreign odors.

The material obtained by acetone extraction of the final product (after acid hydrolysis) does not exceed 0.7 percent by weight and the moisture content of the flour varies between 2 and 3 percent.

The biological value of the protein in the raw material is not impaired by this process, and the resultant fish flour is therefore considered eminently suitable for the enrichment of bread and maize meal. (*Current Affairs Bulletin*, No. 19, July 1957, of the Indo-Pacific Fisheries Council, FAO)



### United Kingdom

**CONTRACT FOR CONSTRUCTION OF 20 TRAWLERS FOR RUSSIA ABOUT COMPLETE:** Construction of 20 trawlers for the Soviet Union by a British shipyard is proceeding apace. To date, 12 of these 700-ton vessels have been delivered, and 4 more launched. The £6-million (US\$16.8 million) order should be completed well up to schedule.

Seen during a visit aboard one of these trawlers in the fitting basin was an oilskin-clad workman directing a high-pressure jet of water at the wheelhouse, while a group of serious-faced Russian inspectors watched keenly for leaks in the windows.

The trials of the first trawler delivered took six weeks for, although all equipment installed undergoes rigorous factory tests before delivery to the yard, the Russians insist on even more thorough tests once it is installed in the ship.

For example, electric motors rated for 24 or 48 hours have to be run for that full length of time. All wiring is checked before and after running. Even a missing nameplate on a casing has been cause for rejection of a particular piece of equipment. Time for trials has been cut down to 10 days on more recent deliveries, but none of the Russians' stringency has been relaxed.

NOTE: SEE *COMMERCIAL FISHERIES REVIEW*, DECEMBER 1956, PP. 81, 82.

The skipper of each Russian trawler delivered has, as a member of the Acceptance Commission, insisted on his own rigging modifications. This has meant the scrapping of standard rigging design, and the extra cost and time of fabricating individual rigging for each trawler--although specifications were thrashed out for 7 or 8 months before construction got under way.

A sidelight on Russian thoroughness is the incorporation of four alternative methods of steering, against the two methods standard on British trawlers. Steering by power, by power-assisted manual operation, by hand operation only, or by tiller with relieving tackle from the winch are all provided on these vessels.

These vessels are built to the highest class of Lloyd's Register of Shipping (motor trawler), and are assigned a free-board. This is contrary to general British practice for trawlers, and the Russians will not be able to put into foreign ports loaded down below their marks. They carry a crew of 44--it is rumored that some will be women, who will work in the fish meal and liver plants on board (*Fishing News*, August 30, 1957).

\* \* \* \* \*

**FISH WORKERS' WAGE DISPUTE AT GRIMSBY UNSETTLED:** The deadlock at Grimsby, England, over the application of Grimsby fish workers of a substantial increase in their wage rates was unsettled at the beginning of November. Workers rejected as "totally inadequate" an offer of an increase of 5 shillings (70 U. S. cents) a week for women and unskilled workers only.

The majority of the 3,500 workers involved are members of the National Union of General and Municipal Workers, though some are members of the Transport and General Workers' Union.

Talks opened in June between the Grimsby Fish Merchants' Association and the unions, which were asking for a substantial increase in wage rates and a deletion of incentive and bonus schemes.

At one meeting the owners offered an increase of 5 shillings (70 U. S. cents) a week for the women workers, the majority of whom are employed in making fish cakes, fish sticks, and engaged in preparing prepacked fish foods. A similar increase was offered to unskilled male workers with relative increases for juniors. The offers would bring the minimum rates for adult women to £5 6s. 6d. (US\$14.91) and for adult unskilled men to £7 15s. (US\$21.70) a week. No offer was made for the skilled workers, filleters, and splitters.

After the meeting an official of the General and Municipal Workers' Union said that the higher-grade workers were of the opinion that the offer would only reduce the differential between them and the lower grades (Fish Trades Gazette, November 1, 1957).

\* \* \* \* \*

**FROZEN FISH FILLETS USED FOR PET FOOD:** A cat-food pack consisting of four whiting fillets is the latest development in quick-frozen pet food, the November 1, 1957, issue of The Fishing News states. The packers report that sales are encouraging and that it is difficult to obtain enough raw material. Another firm in Grimsby reports that they have been packing raw fish for cats (usually whiting) for the past two months. The raw small whiting are packed in an 8-oz. carton that is overwrapped with heat-sealed cellophane to prevent odor and seepage.

More than £40 million (US\$112 million) a year is spent in Great Britain for pet food, with about £13 million (US\$36.4 million) estimated as spent for cat food. Sales of prepared pet foods amount to about £10 million (US\$28 million). According to a booklet on the Economics of Domestic Pets, the average monthly cost of specially-made and nonprepared foods per cat is about 4s. 6d. (63 U. S. cents). There are 5 or 6 firms now manufacturing prepared pet foods, one of which packs 1 million cans weekly. Pet food utilizes most of the whale meat imported by Britain and also large quantities of fish equal in quality to that which enters the retail market.

One British firm began marketing a frozen pack for pets about six years ago, and the demand for its product has been increasing. There is a ready market for a frozen raw fish product, states this company, for besides national coverage, it also exports the frozen pet-food pack to more than 20 countries.

\* \* \* \* \*

**GOVERNMENT COMMITTEE TO STUDY FISHING INDUSTRY:** The British Annual Fisheries Report for 1957 referred to the Government's intention to appoint a "Committee of Inquiry into the fishing industry." The British Government has now announced the appointment of the committee and made public the terms of reference, which are: "To assess, in relation to developments in fishing and the marketing of fish, the size and pattern, and implications, of an economic fishing industry in the United Kingdom, and to report."

Answering a question in Parliament regarding this study, the British Minister of Agriculture and Fisheries said: "The main object of this inquiry is to find people

who are independent of the industry itself and so will be able to consider objectively the evidence that will be given to them from all sections and branches of this industry," reports a December 4, 1957, dispatch from the United States Embassy in London.

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GRIMSBY IMPORTS LARGEST CARGO OF FROZEN HALIBUT: What is believed to be the largest single cargo of frozen halibut to be imported through Grimsby, England, from Norway was reported on November 4, 1957. The Norwegian refrigerated ship Polaris delivered 200 metric tons of halibut to a large Grimsby cold storage company. This was the second time in less than three weeks (70 tons arrived on October 18) that the Polaris had brought in a cargo of frozen Norwegian halibut, states the November 9, 1957, Fish Trades Gazette.

The British firm is building up stocks of frozen halibut for winter trade when supplies of fresh fish are apt to be light. The Norwegian halibut had been caught by quick-freezing vessels, chiefly off the west coast of Greenland, and had been frozen at sea. The cargo of the Polaris represented the catch of about four Norwegian vessels.

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IMPORT QUOTAS FOR JAPANESE CANNED TUNA, SARDINES, AND CRAB MEAT: Included in the extension of the Anglo-Japanese trade agreements for the six-month period ending March 31, 1958, were quotas for canned tuna, crab meat, and sardines (pilchards). A previous announcement stated that the six-month quota for canned salmon was £2,610,000 (US\$7,308,000 c.i.f. The tuna quota was reduced from £250,000 (US\$462,000) to £85,000 (US\$238,000) and that for canned sardines was set at £15,000 (US\$42,000). Imports of canned crab meat are permitted under "Open Individual License" without limitation of quantity, the United States Embassy in London reports in a dispatch dated November 25, 1957.

NOTE: SEE COMMERCIAL FISHERIES REVIEW, JANUARY 1958, P. 100.

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PRE-AUCTION SALES OF FISH INITIATED AT HULL: A pre-auction fish sales scheme, which will enable Hull's wholesale merchants to get their filleting staffs working by 8 a.m., the time at which normal quayside sales begin, was initiated on November 11, 1957.

It was a proposal of the port's trawler owners, and it should be of particular benefit to firms whose premises are away from the dock area, to help speed up processing and dispatching.

The terms of the concession apply solely to limited drawings of bulk cod, subject to the following provisions:

(1) Those who buy in advance of the Dutch auctions must pay 1s. (14 U. S. cents) a kit (140 lbs.) above the average price realized at the normal auctions for the nearest unwithdrawn lot.

(2) The minimum amount of fish which anyone is allowed to tally and remove from any one vessel before 8 a.m. is 40 kits (5,600 lbs.) and the maximum pre-auction purchase by any one buyer from all vessels serving the day's market must not exceed 120 kits (16,800 lbs.).

(3) No fish may be withdrawn before 7 a.m., and then only after it has been inspected by the sanitary authorities.

(4) The maximum daily pre-auction sales shall be limited to 10 percent of the total quantity of fish from any one vessel.

(5) Such sales shall be at the discretion of the owners of the individual vessels concerned. (The Fishing News, Nov. 8, 1957.)

\* \* \* \* \*

**PROPERTIES OF NYLON YARN AND NETTING:** How to lower costs and increase catches by using the most suitable nets was discussed by a representative of a British nylon manufacturing firm in a paper given at the International Fishing Gear Congress held in Hamburg, West Germany, in October 1957. Different aspects of the strength of nylon nets and the mechanics of knotting were discussed.

It was suggested that costs could be lowered by reducing the initial cost of the net; increasing the life of the net; reducing maintenance and handling; and savings in power (as in trawls). To increase catches, the nets should be rendered less detectable (as in gill nets); their holding capacity increased (as in seines); greater speed through the water (as in midwater trawls); net size increased (as in vessels of limited deck capacity); and available fishing hours increased.

No one fiber can find universal acceptance, but it is possible to devise a specification satisfactory for a majority of nets. The author pointed out that nylon was not the cheapest fiber available, but nylon yarns were stronger than any other fiber commercially available.

Comparing the properties of three nylon 66 yarns, he said the energy absorption of 210 denier type 300 on a weight-for-

weight basis was higher than the other two--205 denier type 100 and 840 denier type 600.

The high energy absorption of this particular yarn has been one factor in its ready acceptance in fishing nets. Nylon's present place in fishing nets is largely due to its comparatively high energy absorption under dry and, even more, under wet conditions.

Nylon nets, like all others made from fibers, slowly lose strength in use, but the author stressed their excellent resistance to rotting and attack by chemicals, oils, insects, vermin, bacteria, and molds, and their ability to stand up to considerable flexing and abrasion.

Since they do not rot, drying out in the sun is not essential, so this source of strength loss can be avoided. In certain African fisheries, it is now the habit to store gill nets in the water when they are not being fished.

The abrasion resistance, dry and wet, of nylon 66 was extremely good, the author added. This could be varied by a choice of filament denier. (The Fishing News, October 11, 1957)

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**REACTION OF FISH TO NETS TESTED WITH MODELS:** Model nets about one-eighth commercial size are being used successfully in developing trawler nets, a Scottish Aberdeen Marine Laboratory scientist announced in a paper read before the International Fishing Gear Congress held in Hamburg, Germany, early in October 1957. It was also stated that the performance of models differs from the full-size originals, but when used with care, models can give results difficult to achieve in any other way. The paper described the comparison made between models and full-size gear during trials between 1954 and 1956 and gave an outline of the theory of modeling; a method whereby faithfulness of reproduction in the model can be determined on the drawing board; an account of the shape assumed by the models in the towed condition; and a short study of fish reactions.

The choice of a model size is dependent on the towing power of the available boat and, when looking for bad features in the design of a net, the model should ideally correspond mesh for mesh with the original, with twine diameter proportionately reduced.

Practical considerations, however, often force a compromise, and a quarter-scale model with a half-scale mesh are reasonable compromises.

To obtain information on the reactions of fish to the gear, a small net of some 20 feet headline length, towed by a 15

horsepower cable, is big enough. The net should be made with meshes of the size used commercially.

The net chosen for comparison was the small Aberdeen trawl used by most trawlers from that port, with headline of 62-1/2 feet.

For the model to have the same shape underwater as the original, the weights and flotation should bear the same ratio to the lifts and drags.

In a discussion of underwater observations, it was stated (1) the reaction of fish to small nets most observed was that they tended to swim away perpendicularly in front of a moving wire or rope when both were on or near the bottom; (2) if the maximum sustained swimming speed which the fish can or is inclined to attain is known, it becomes possible to make some calculations on the optimum angle of attack of the wire; (3) not all fish that come within the path of sweeps and spreading wires finish up in the path of the net, nor does every fish in the path of the net finish up in the cod end; (4) a common line of escape from the path of a net was below the ground-rope (flatfish were often pinned against the netting by the flow of water through it); (5) shoaling fish are in some respects easier and in others harder to catch than fish in company, so that any defect in design is doubly serious (this seems to hold a significant lesson in the design of trawls or the capture of shoaling fish, with the object of delaying the escape reaction until the possibilities are precluded).

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**TRAWLERS LAND BOXED FISH:** Some Scottish trawlers are boxing their fish at sea and landing their boxed catches at Grimsby, England. However, this has created a problem as to the correct number of lumpers or unloaders to be employed when boxed fish is unloaded from trawlers.

The number of men needed to land an ordinary catch is laid down in a manning scale agreed to by owners and lumpers. This scale, planned for catches where the fish had to be dug out of ice in the fish hold, and subsequently sorted and weighed on shore, is obviously not suited to boxed fish.



The lumpers are of the opinion that catches of this good-quality fish should be encouraged at a port like Grimsby, which has a name for quality.

They are also anxious to get some form of manning scale laid down for boxed fish and have asked the trawler owners to meet them to discuss the whole question of landings of boxed fish.

\* \* \* \* \*

**USE OF SYNTHETIC FIBER "TERYLENE" IN FISH NETS DESCRIBED:** The synthetic fiber "terylene" is beginning to be used successfully in the manufacture of fish nets, according to a report made to the International Fishing Gear Congress, held in Hamburg, West Germany, October 7-12. This synthetic fiber, developed by a British firm, has been used successfully in gill- and trawl-netting. According to the report, a number of British trawler companies are testing the fiber for near-, middle-, and distant-water fishing.

The British Ministry of Fisheries is conducting trials with "terylene" in middle-water trawls and purse-seine netting, and expect to test the fiber in other fisheries in the near future.

"Terylene polyester" fiber, it was stated, has been used also for lifeboat and hatch covers, yacht sails, and tarpaulins. The fiber is now being manufactured in several European countries and Canada. The British firm produces 25 million pounds a year, and larger outputs are expected.

Development of a high tenacity extra-heavy denier yarn is under way and, when commercially available, the heavier nets, such as trawls, will be produced more economically.

"Many fishermen, net manufacturers, and twine producers have shown favorable reaction to "terylene," and the filament yarn has been exported for twines and nets."

Most important properties claimed for this filament yarn for twines and nets are high tensile strength, unaffected by wetting, and high wet-knot strength; rotproof, not weakened by mildew; good resistance to sunlight; stability on water immersion coupled with low moisture absorption; good resistance to abrasion under wet conditions; and smoothness and transparency of the material.

While "terylene" may lose relatively more strength on knotting than natural fibers, its actual knotting strength remains above their level.

Unlike most synthetic fibers, its abrasion resistance hardly differs under wet conditions. It also has good resistance to attack by acids and oxidizing agents, is resistant to sea water, and unaffected by contact with oils and tar.

Both "terylene" and nylon single-knotted nets are prone to knot slippage, but the tendency to slip is less with "terylene." It is possible to treat the net itself with bonding agents to prevent knot slippage. Nets can also be given a heat treatment to consolidate the knots, either in steam or hot air. Steaming the nets on a frame at 150° C. for 15 minutes has been found most satisfactory.

The paper questioned the necessity to dye synthetic nets, although dyeing has been shown sometimes to give increased catches. As an example, blue-grey nets are used for Norwegian lake trout.

"It is clear that fishermen in general demand nets dyed to a wide variety of shades, from reddish-brown to green and blue, and in many cases they prefer to dye their own nets."

"Suitable dyestuff packages are available to enable the fisherman to dye his nets satisfactorily to a variety of shades at

home if need be. An allowance for shrinkage must be made if the mesh size of the net is critical."

"Terylene" nets are easy to handle because thinner twines can be used and the result is lighter nets, and trawl nets can be towed more easily through the water. "It is thus possible to use larger nets than normally possible with traditional fibers or alternatively smaller vessels can be employed to handle the net."

The synthetic-fiber nets are more expensive than those of natural fiber. The difference in price is less marked when fiber is made into nets because twines of greater runnage (number of feet per pound) can be used.

"Terylene" filament twines can be handled on traditional net-making machines. They are said to be easier to make than from other synthetic fiber because of their high resistance to stretch. The twines have been processed satisfactorily on single-knot machines.

Describing the development of "terylene" fiber for netting, the paper said a mixed tenacity acetate netting twine was being developed, mainly for pilchard nets. Such a twine would not bruise or damage the fish and would not slip when single-knotted.

The gill-netting has been used successfully, principally for catching salmon and cod. "Terylene" nets have shown up to particular advantage in fast-moving water or ocean currents, where lively fish can dive straight through the net, or when caught by the gills can escape by expanding the net mesh.

"Terylene" drift-netting is being developed to give thicker and more suitable twines, as all synthetic fibers cut into and damage soft fish such as herring. The filament yarn has been used successfully for bottom trawls.

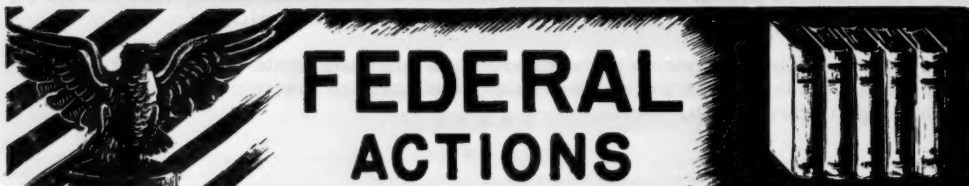
During tests by distant-water trawlers it was found that each trawl net lasted on the average about nine trips and there was one instance of 15 trips recorded before the net was finally lost. The normal net under these conditions is generally good for an average of one trip.

The "terylene" nets were much easier to tow and, being completely rotproof, drying was unnecessary.

It is understood that cleaner catches were obtained. The ship's crew reported that the "terylene" nets were more pleasant to handle than nets normally used. With a "terylene" trawl, unloading of the cod end may sometimes be made in fewer operations because of its greater strength.

A "terylene" purse-seine net may cost as much as £5,000 (US\$14,000), but trials carried out in Canada with drum seines are encouraging and, with suitable modifications, it should be possible to use these purse seines with great profit.

The twines are also being tried with encouraging results for lobster pots in place of natural fibers, chiefly because of their rot resistance and general toughness. Head ropes made from the fiber are also being tried out.



# FEDERAL ACTIONS

## Federal Trade Commission

### FOUR SALMON PACKERS DENY CHARGES OF ILLEGAL BROKERAGE PAYMENTS:

Four Seattle, Wash., packers of canned salmon have denied Federal Trade Commission charges of making illegal brokerage payments to some customers.

The packers deny they have granted large grocery chains discounts or allowances in lieu of brokerage in violation of Sec. 2 (c) of the Clayton Act, as amended by the Robinson-Patman Act. Each of the packers filed a separate answer (Answers 6904-6907 incl., canned salmon) to the Commission's complaints.

The packers deny that on direct sales which do not involve brokers the market price to the chains is reduced by 5 percent--the amount of the normal brokerage fee. They also deny giving a 2.5-percent reduction when only one broker is used, either a primary or field broker, and taking the price differential out of the broker's commission.

The complaints had said the packers generally sell through both types of brokers. Primary brokers are the selling agents for the Seattle area while field brokers are those employed by the primaries to handle transactions in other market areas.

One of the four companies denies it gave the chains illegal discounts by (1) reducing prices on direct sales by the 5 percent which normally would be paid for brokerage, (2) granting a reduction of 2.5-percent where only one broker is used, and (3) allowing a 2.5-percent discount on sales made through the buyers' own purchasing agents. For example, the company admits that in 1955 it agreed to sell a lot of 5,000 cases of pink salmon directly to the buying organization of a large chain at a price reduction of 50 cents a case under the price originally set. Denying this was an illegal brokerage payment, the company asserts, among other things, that it and other small packers cannot command the higher prices charged by larger, more successful packers "who have built up a label acceptance over the years . . ."

Retailers will not buy unknown and unadvertised brands without price concessions. These concessions, the answer continues, "cannot be made by the small packer without selling at an actual loss and would be, in defendants' opinion, much more than the 5 percent which is the normal brokerage paid . . ."

The second of the four companies denies it grants unlawful brokerage to the chains by (1) reducing prices about 2.5 percent where either a primary or field broker was not used, (2) selling through primaries at a net price below that shown by the broker, with the difference being absorbed by the broker out of commissions, and (3) granting direct or indirect price reductions by cutting brokerage earnings of the primary or field brokers.

The third company denies it has made sales to a large grocery chain through the chain's buying agent at prices which are reduced by approximately the 5-percent commissions usually paid on sales made through brokers.

The fourth firm consists of three affiliated companies. The group denies it sells direct to large grocery chains at prices reduced by the 5 percent which is usually paid for brokerage. They also deny that "any difference in the net selling price to various customers is due to any factor other than factors arising from differences in the time of sales or commitments for sale."

All the parties ask that the complaints be dismissed, a December 4, 1957, news release from the Federal Trade Commission points out.

NOTE: ALSO SEE COMMERCIAL FISHERIES REVIEW, DECEMBER 1957, P. 79.

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### SIX CANNED SALMON PRIMARY BROKERS CHARGED WITH MAKING ILLEGAL BROKERAGE PAYMENTS TO SOME BUYERS:

The Federal Trade Commission on January 6 charged six primary brokers of canned salmon and other seafood, all of Seattle, Wash. (Complaints 6977-6982 incl., Canned Seafood) with making illegal brokerage payments to some buyers.

The six were named in separate complaints. Each is charged with granting certain buyers discounts or allowances in lieu of brokerage in violation of Sec. 2(c) of the Robinson-Patman Amendment to the Clayton Act. In addition, two are charged with receiving brokerage fees on purchases made for their own accounts, while another of the six is charged with granting allowances to field brokers purchasing for their own accounts.

According to the complaints, primary brokers are the selling agents for the Seattle area while field brokers are those employed by the primaries to handle transactions in other market areas. A primary broker usually is paid 5 percent commission, except where a field broker is employed. In the latter instance, each usually receives a 2.5-percent split.

The complaints allege that the respondent brokers give some buyers illegal price concessions and rebates in lieu of brokerage, and absorb these allowances out of brokerage earnings. Examples cited include selling at lower prices than those accounted for to packers, and granting rebates but not charging them back to their packer-principals.

The specific charges for each firm involved are as follows:

The complaint charges one of the six firms with making illegal price concessions by (1) selling at net prices which were less than those accounted for to the packers, and (2) granting price deductions which were not charged back to the packers in whole or in part.

The second brokerage concern, the complaint alleges, used the following methods in making unlawful allowances: (1) sold at net prices which were less than those accounted for to the packers, (2) granted price deductions, a part or all of which were not charged back to the packers, and (3) took reduced brokerage on sales which involved price concessions.

The third company, the complaint charges, gave large chains illegal grants in transactions not involving field brokers by the following means: (1) granted rebates which were not charged back to the packers but were taken from its commission, and (2) granted discounts which ostensibly were charged back to the packers but were actually borne by itself through taking a 2.5-percent brokerage fee instead of the customary 5 percent.

The individual trading as the fourth firm, in transactions where he acted as a primary broker, the complaint says he (1) granted rebates (such as freight payments, "trade discounts," and "promotional allowances") to certain buyers which were not charged back to his principals but were taken from his fees, and (2) sold at net prices lower than those accounted for to the packers. He also sells canned seafood for his own account. The complaint further charges that he unlawfully has accepted brokerage commissions on purchases of seafood which he resells at a profit.

The fifth firm is charged with affording price differentials to certain buyers by (1) selling at net prices which were less than those accounted for to the packers, (2) granting price deductions, a part

or all of which were not charged back to the packers, and (3) taking reduced brokerage on sales which involved price concessions. This firm, the complaint further charges, has made substantial allowances in lieu of brokerage to certain field brokers who were purchasing for their own account for resale.

The individual trading as the sixth firm is charged with using these means to make unlawful price concessions: (1) selling at net prices which were less than those accounted for to the packers, (2) granting rebates which were not charged back to the packers but absorbed out of his brokerage earnings, and (3) taking reduced brokerage on large sales which involved price concessions. He also received the customary 5 percent brokerage fee on purchases of canned salmon for his own account, the complaint alleges, and has paid buyers 2.5 percent brokerage on the resale of these products.

The parties are granted 30 days in which to file answers to the complaints. Hearings before a Federal Trade Commission hearing examiner are scheduled in Seattle, Wash., on separate dates for each of the six brokers late in March and early in April 1958.



## Interstate Commerce Commission

### RAILWAY EXPRESS REQUESTS 15-PERCENT INCREASE IN RATES AND CHARGES:

The Interstate Commerce Commission (docket Ex Parte 210) is considering a petition of the Railway Express Agency for a 15-percent increase in its rates and charges. Hearings in this case were reconvened in Washington, D. C., on December 16, 1957. Testimony prepared in the U. S. Bureau of Commercial Fisheries was presented on December 17 and indicated that the increase in rates and charges requested by the petitioner would be damaging to the domestic fisheries.



## U. S. Court of Customs and Patent Appeals

### FOOD PROCESSORS WHOSE PRODUCTS DIFFER IN CUSTOM CLASSIFICATION FROM COMPETITIVE IMPORTS NOT BARRED FROM TARIFF RATE PROTESTS:

A domestic food processor whose products differ in custom classification from competitive imports is not barred for that reason from legal action protesting tariff rates assessed such imports, the U. S. Court of Customs and Patent Appeals in Washington, D. C., ruled in December 1958.

The Washington court decision involved an appeal filed by Star-Kist Foods after the U. S. Customs Court, New York City, threw out its suit attacking the duty rate set for imported Japanese tuna packed in brine. Star-Kist sued under section 516 (b) of the 1930 Tariff Act which gives American producers, manufacturers or wholesalers the right to protest rates assessed imported merchandise of the same class or kind sold by them. The New York court held that Star-Kist did not have a right of action because its tuna fish products came under a different customs classification and, therefore, were not of the same class or kind.

The Customs Appeal Court overruled the lower court and remanded the case for further proceedings. It held unanimously that while customs classification is a material factor in determining "class or kind," it is not per se sufficient to preclude a cause of action under section 516 (b). Star-Kist's tuna products, the court concluded, are of the same class or kind as those imported from Japan. (Food Field Reporter, December 9, 1957.)



## Department of Agriculture

### AGRICULTURAL MARKETING SERVICE

#### PROPOSED VOLUNTARY STANDARDS FOR FROZEN FISH BLOCKS:

Proposed voluntary United States standards for frozen fish blocks, de-

veloped through the cooperative efforts of the U. S. Bureau of Commercial Fisheries, the fishing industry, and the National Fisheries Institute, were published on December 21, 1957, by the U. S. Department of Agriculture under the terms of its agreement with the U. S. Department of the Interior in the Federal Register of that date as a Notice of Proposed Rule Making. A 30-day period (until January 21, 1958) was given during which the industry could make known its views or exceptions on the proposed standards for fish blocks (skinless fish fillets used in the manufacture of frozen fried fish sticks and other prepared fish products).

The proposed standards apply to blocks prepared from wholesome skinless fillets or portions of wholesome skinless fillets which conform to the industry-accepted definition of the product. The most important elements of the definition require that the raw material be wholesome and that the block itself be of uniform rectangular shape and be unglazed. The grades, designated "U. S. Grade A" and "U. S. Grade B," are determined primarily by rating on scoring system the appearance, uniformity of size and symmetry, freedom from defects, and character of blocks. Standards also recommend weights and dimensions.

## DEPARTMENT OF AGRICULTURE

### Agricultural Marketing Service

#### [ 7 CFR Part 52 ]

#### U. S. STANDARDS FOR GRADES OF FROZEN FISH BLOCKS<sup>1</sup>

##### NOTICE OF PROPOSED RULE MAKING

Notice is hereby given that the United States Department of Agriculture is considering the issuance of the United States Standards for Grades of Frozen Fish Blocks pursuant to the authority contained in the Agricultural Marketing Act of 1946 (60 Stat. 1087 et seq., as amended; 7 U. S. C. 1621 et seq.). These proposed grade standards are recommended by the Fish and Wildlife Service, U. S. Department of the Interior, based on data developed by that agency. These standards, if made effective, will be the first issue by the Department of grade standards for this product.

All persons who desire to submit written data, views, or arguments for consideration in connection with the proposed standards should file the same with the

<sup>1</sup> Compliance with the provisions of these standards shall not excuse failure to comply with the provisions of the Federal Food, Drug, and Cosmetic Act.



Chief, Processed Products Standardization and Inspection Branch, Fruit and Vegetable Division, Agricultural Marketing Service, U. S. Department of Agriculture, Washington 25, D. C., not later than 30 days after publication hereof in the FEDERAL REGISTER.

The proposed standards are as follows:

#### PRODUCT DESCRIPTION AND GRADES

- Sec.  
52.3681 Product description.  
52.3682 Grades of frozen fish blocks.

#### WEIGHTS AND DIMENSIONS

- 52.3683 Recommended weights and dimensions.

#### FACTORS OF QUALITY

- 52.3684 Ascertaining the grade.  
52.3685 Evaluation of the unscored factor of flavor and odor.  
52.3686 Ascertaining the rating for the factors which are scored.  
52.3687 Appearance.  
52.3688 Uniformity of size and shape.  
52.3689 Defects.  
52.3690 Character.

#### DEFINITIONS

- 52.3691 Definitions.

#### LOT CERTIFICATION TOLERANCES

- 52.3692 Tolerances for certification of officially drawn samples.

#### SCORE SHEET

- 52.3693 Score sheet for frozen fish blocks.

AUTHORITY: §§ 52.3681 to 52.3693 issued under sec. 205, 50 Stat. 1090, as amended; 7 U. S. C. 1624.

#### PRODUCT DESCRIPTION AND GRADES

§ 52.3681 *Product description.* Frozen fish blocks are rectangular-shaped masses of cohering frozen fish flesh of a single species consisting of adequately drained whole, wholesome, skinless fillets or pieces of whole, wholesome, skinless fillets cut into small portions but not ground or comminuted. They are frozen, but not glazed, and maintained at temperatures necessary for the preservation of the product.

#### § 52.3682 *Grades of frozen fish blocks.*

(a) "U. S. Grade A" is the quality of frozen fish blocks that possess a good flavor and odor; and for those factors which are rated in accordance with the scoring system outlined in these standards have a total score of 85 to 100 points.

(b) "U. S. Grade B" is the quality of frozen fish blocks that possess at least a reasonably good flavor and odor; and for those factors which are rated in accordance with the scoring system outlined in these standards have a total score of 70 to 84 points: *Provided*, That no factor receives maximum point score deduction.

(c) "Substandard" is the quality of frozen fish blocks that fail to meet the requirements of U. S. Grade B.

#### WEIGHTS AND DIMENSIONS

§ 52.3683 *Recommended weights and dimensions.* (a) The recommendations as to weights and dimensions of frozen fish blocks are not incorporated in the

grades of the finished product since weights and dimensions, as such, are not factors of quality for the purpose of the grades. The degree of uniformity of size and shape among units of the finished product is rated since it is a definite factor affecting the quality of the end product prepared from the blocks.

(b) It is recommended that the thickness or depth (smallest dimension) of the frozen fish block be not greater than 10 centimeters (4.0 inches) and that the

average weight be not less than 2.3 kilograms (5.0 pounds) and not greater than 22.7 kilograms (50.0 pounds).

#### FACTORS OF QUALITY

§ 52.3684 *Ascertaining the grade—(a) General.* In addition to considering other requirements outlined in the standards, the following factors are evaluated in ascertaining the grade of the product:

(1) *Factors not rated by score points.* Flavor and odor.

TABLE I—SCORE DEDUCTIONS FOR COLOR SUBFACTOR

Condition of the surface of the block	Deduction Points
"Light" portion of fish flesh <sup>1</sup> .....	No discoloration.....
"Dark" portion of fish flesh <sup>2</sup> .....	No discoloration.....
"Light" portion of fish flesh.....	No discoloration.....
"Dark" portion of fish flesh.....	Slight yellowing.....
"Light" portion of fish flesh.....	Slight yellowing.....
"Dark" portion of fish flesh.....	Moderate yellowing; no rusting.....
"Light" portion of fish flesh.....	Moderate yellowing; slight rusting.....
"Dark" portion of fish flesh.....	Excessive yellowing; slight rusting.....
"Light" portion of fish flesh.....	Excessive yellowing; moderate rusting.....
"Dark" portion of fish flesh.....	Excessive yellowing and rusting.....
"Light" portion of fish flesh.....	Excessive yellowing and rusting.....
"Dark" portion of fish flesh.....	Excessive yellowing and rusting.....

<sup>1</sup> "Light" portion refers to fish fillet flesh comprising the main portion of the fillet.

<sup>2</sup> "Dark" portion refers to the dark-colored portion of the fillet appearing under the skin, the main part of which occurs along the lateral line.

<sup>3</sup> Fish blocks which receive 25 deduction points for this subfactor shall not be graded above Substandard regardless of the total score for the product. This is a limiting rule.

NOTE: Color of the block should be normal to that of the species of fish used. Deviations from the normal color result from oxidation or other changes that have taken place in the fish prior to freezing and after freezing and storage. Ordinarily, the type of discoloration observed is due to oxidation and results in yellowing and "rusting" of the fish surfaces.

TABLE II—SCORE DEDUCTIONS FOR "DEHYDRATION" SUBFACTOR

Condition of surface of block	Deduction points
Surface area affected	Degree of dehydration
Percent	
Up to 50.....	Slight.....
Greater than 50 and up to 100.....	Slight.....
Greater than 0 and up to 25.....	Moderate.....
Greater than 25 and up to 50.....	Moderate.....
Greater than 0 and up to 25.....	Marked.....
Greater than 25 and up to 50.....	Marked.....
Greater than 0 and up to 25.....	Excessive.....
Greater than 25 and up to 50.....	Excessive.....
Greater than 0 and up to 25.....	Excessive.....
Greater than 25 and up to 50.....	Excessive.....
Greater than 0 and up to 25.....	Excessive.....
Greater than 25 and up to 50.....	Excessive.....

<sup>1</sup> Fish blocks which receive 25 deduction points for this subfactor shall not be graded above Substandard regardless of the total score for the product. This is a limiting rule.

NOTE: Dehydration is classified in four degrees:

(a) *Slight.* Shallow and not color masking;

(b) *Moderate.* Deep but just deep enough to mask color of fish flesh;

(c) *Marked.* Deep and easily scraped off with finger nail, and masks color of flesh; and

(d) *Excessive.* Deep dehydration not easily scraped off.

TABLE III—SCORE DEDUCTIONS FOR DIMENSIONS SUBFACTOR

Deviations (+ or -) from the declared dimensions	Deduction points
Length and width	Thickness
Millimeters	Millimeters
Up to 3.....	Up to 2.....
Greater than 3 and up to 5.....	Up to 2.....
Greater than 5 and up to 8.....	Greater than 2 and up to 3.....
Greater than 8 and up to 12.....	Greater than 3 and up to 4.....
Greater than 12 and up to 16.....	Greater than 4 and up to 5.....
Greater than 16 and up to 20.....	Greater than 5 and up to 6.....
Greater than 20 and up to 25.....	Greater than 6 and up to 7.....
Greater than 25 and up to 30.....	Greater than 7 and up to 8.....
Greater than 30 and up to 35.....	Greater than 8 and up to 9.....
Greater than 35 and up to 40.....	Greater than 9 and up to 10.....
Greater than 40 and up to 45.....	Greater than 10 and up to 11.....
Greater than 45 and up to 50.....	Greater than 11 and up to 12.....
Greater than 50 and up to 55.....	Greater than 12 and up to 13.....
Greater than 55 and up to 60.....	Greater than 13 and up to 14.....
Greater than 60 and up to 65.....	Greater than 14 and up to 15.....

<sup>1</sup> These values refer to deviations of any one of the four readings taken for the thickness of the individual block from the declared thickness of the block.

<sup>2</sup> Fish blocks which receive 25 deduction points for this subfactor shall not be graded above Substandard regardless of the total score for the product. This is a limiting rule.

NOTE: Measurements are made in millimeters. Two readings are taken for the length; three for the width; and four for the thickness. Each group is averaged.

(2) *Factors rated by score points.* The relative importance of each factor which is rated is expressed numerically on the scale of 100. The four factors and the maximum number of points that may be given each are as follows:

Factors:	Points
Appearance	25
Uniformity of size and shape	20
Defects	40
Character	15
Total score	100

(b) *Condition of product for evaluation.* The grade of frozen fish blocks is ascertained by observing the product in the frozen state and after representative portions have been heated in a suitable manner.

§ 52.3685 *Evaluation of the unscored factor of flavor and odor—(a) Good flavor and odor.* "Good flavor and odor" (essential requirement for a Grade A product) means that the product has the good flavor and odor characteristic of the species of fish; and that the product is free from staleness, and from off-flavors and off-odors of any kind.

(b) *Reasonably good flavor and odor.* "Reasonably good flavor and odor" (minimum requirement of a Grade B product) means that the fish flesh may be somewhat lacking in the good flavor and odor characteristic of the species of fish; is reasonably free from rancidity; and is free from objectionable off-flavors and objectionable off-odors of any kind.

§ 52.3686 *Ascertaining the score for those factors which are rated.* The essential variations within each factor which is rated are so described that the value may be ascertained for each factor and expressed numerically. Point deductions are allotted for each degree or amount of variation within each factor. The value for each factor is the maximum points allotted for the factor less the sum of the deviation deduction-points within the factor.

§ 52.3687 *Appearance—(a) General.* The factor of appearance refers to the color of the fish flesh, and to the degree of surface dehydration of the product.

(b) *For the purpose of rating the factor of appearance the schedule of deviation deduction-points in Tables I and II apply.*

§ 52.3688 *Uniformity of size and shape—(a) General.* The factor of uniformity of size and shape refers to the degree of conformity to declared dimensions and to rectangular shape.

(1) *"Angles" of a block.* There are 12 angles considered to form a block. Right angles are formed by the intersection of the four sides with the top and bottom (the two largest surfaces); and four angles are formed by the intersection of the four sides with one another. In a perfect block the surfaces form into a right angle (90 degrees).

(b) *For the purpose of rating the factor of uniformity of size and shape, the*

*schedule of deviation deduction-points in Tables III and IV apply.*

TABLE IV—SCORE DEDUCTIONS FOR "ANGLES" SUBFACTOR

Number of "unacceptable" angles	Deduction points
1	0
2	1
3	2
4	3
5	4
6	5
7	6
8	10

NOTE: There are 12 angles considered to form a block. Right angles (edge) are formed by the intersection of the four sides within the top and bottom; four angles (corner) are formed by the intersection of the four sides with one another.

An "acceptable" edge angle is one in which the two surfaces forming the angles are within 1.0 cm. (3/8 inch) of the apex of a carpenter's square placed along the surfaces (use 3 readings for each edge angle measurement, 2 or 3 must meet the requirement). An "unacceptable" edge angle is one showing greater deviation than the 1.0 cm. (3/8 inch).

An "acceptable" corner angle is one in which at least one edge surface is within 1.3 cm. (1/2 inch) of the apex of a carpenter's square placed on the edge surfaces (use 1 reading for each corner angle). An "unacceptable" corner angle is one showing greater deviation than the 1.3 cm. (1/2 inch).

§ 52.3689 *Defects—(a) General.* The factor of defects refers to the degree of freedom from damage, blemishes, improper fill, and bones.

(1) *"Damaged."* Damaged means crushed or mutilated block, and imbedding of the packaging material into the block, to the extent that the usability of that portion of the block has been adversely affected; and cut or separation of the masses of fish flesh in the block.

(2) *"Blemish."* Blemish means a piece of skin, scales, blood spot, a bruise, a black belly lining, a fin, or harmless extraneous material. One "piece of skin" consists of one piece 3.3 square centimeters (1/2 square inch) in area; except that skin patches larger than 9.9 square centimeters shall be considered as two pieces of skin. "Blood spot" is one of such size and degree as to be considered objectionable. "Black belly lining" is any piece longer than 1.3 centimeters (1/2-inch). "Fin" is one fin or one identifiable part of a fin. "Scales" are aggregates of one or more scales of such degree as to be considered objectionable.

(3) *"Improper fill."* Improper fill means the frozen block does not form a completely solid mass as evidenced by presence of air spaces, ice, depressions, and ragged edges (pieces of fish protrude or recede at the edges of the block).

(4) *"Bones."* Bones means any bones that can be separated from the product, can be identified, and are objectionable. One instance of bone means one bone or one group of bones occupying or contacting a circular area of 6.45 square centimeters (one square inch).

(b) *For the purpose of rating the factor of defects, the schedule of deviation deduction-points in Tables V, VI, VII, and VIII apply.*

TABLE V—SCORE DEDUCTIONS FOR "DAMAGE" SUBFACTOR

Amount of damage to block	Deduction points
0 to 0.30 percent	0
For each 0.30 percent above 0.30 percent and up to 8.10 percent	1
8.11 percent and over	10

† Fish blocks which receive 40 deduction points for this subfactor shall not be graded above Substandard regardless of the total score for the product. This is a limiting rule.

NOTE: Damage is measured by volume of the block affected. The area of damage is measured in cubic centimeters using a millimeter rule to determine the exact length, width, and thickness of the block affected. Calculate damage in "percent" using the following formula:

$$\text{Total damage in "percent" (volume/weight)} = \frac{\text{(Total damage)}}{\text{(Weight of block)}} \times 100$$

TABLE VI—SCORE DEDUCTIONS FOR "BLEMISH" SUBFACTOR

Number of blemishes per 2.3 kg. (5 lb.) of block	Deduction points
0 to 1.0	0
1.1 to 2.0	1
2.1 to 3.0	2
3.1 to 4.0	3
4.1 to 5.0	4
5.1 to 6.0	5
6.1 to 7.0	12
7.1 to 8.0	17
8.1 to 9.0	22
9.1 to 10.0	30
10.1 or more	40

† Fish blocks which receive 40 deduction points for this subfactor shall not be graded above Substandard regardless of the total score for the product. This is a limiting rule.

TABLE VII—SCORE DEDUCTIONS FOR "IMPROPER FILL" SUBFACTOR

Amount of "improper fill" in block	Deduction points
0 to 0.30 percent	0
For each 0.30 percent above 0.30 percent and up to 8.10 percent	1
8.11 percent and over	10

† Air spaces, ice spaces, depressions, and ragged edges. † Fish blocks which receive 40 deduction points for this subfactor shall not be graded above Substandard regardless of the total score for the product. This is a limiting rule.

NOTE: Improper fill is measured by the volume of the block affected. Air spaces and ice spaces are measured by filling these spaces with water or other material and measuring the volume. Spaces less than 3 ml. in volume or less than 2 mm. deep are not considered. Depressions and ragged edges are measured by exact volume of the block affected using a mm. rule to determine the length, width, and thickness of the block affected. Calculate the total "improper fill" in "percent" from the following formula:

$$\text{Total "improper fill" in "percent" (volume/weight)} = \frac{\text{(Total volume of "improper fill")}}{\text{(Weight of block)}} \times 100$$

TABLE VIII—SCORE DEDUCTIONS FOR BONES SUBFACTOR

Instances of bone per 2.3 kg. (5.0 lb.) of fish	Deduction points
0	0
0.1 to 1.0	1
1.1 to 2.0	2
2.1 to 3.0	3
3.1 to 4.0	10
4.1 to 5.0	15
5.1 to 6.0	35
6.1 and more	40

† Fish blocks which receive 40 deduction points for this subfactor shall not be graded above Substandard regardless of the total score for the product. This is a limiting rule.

§ 52.3690 *Character—(a) General.* The factor of character refers to the

tenderness and to the moistness of the properly heated fish flesh, and to the tendency of the pieces of fish or fillets in the block to remain as a unit when the block or portions of the block are heated.

(b) For the purpose of rating the factor of character, the schedule of deviation deduction-points in Tables IX and X apply.

TABLE IX—SCORE DEDUCTIONS FOR TEXTURE SUBFACTOR

Texture condition of the cooked fish	Deduction points
Firm; slightly resilient but not tough or rubbery; moist but not mushy.....	0
Moderately firm; only slightly tough or rubbery; does not form a fibrous mass in the mouth; moist, but not mushy.....	2
Moderately tough or rubbery; has noticeable tendency to form a fibrous mass in the mouth; or is dry; or is mushy.....	6
Tough or rubbery; has marked tendency to form fibrous mass in the mouth; or is very dry; or is very mushy.....	7
Objectionably tough, rubbery, dry or mushy.....	115

<sup>1</sup> Fish blocks which receive 15 deduction points for this subfactor shall not be graded above Substandard regardless of the total score for the product. This is a limiting rule.

#### DEFINITIONS

§ 52.3691 *Definitions*—(a) "Heating in a suitable manner." Heating in a suitable manner means heating the product as follows:

(1) Cut three or more portions about four by three by one-half inches from a

TABLE X—SCORE DEDUCTIONS FOR COHESION SUBFACTOR

Cohesion condition of the cooked fish	Degree
The pieces comprising the cooked sample cohere very tightly. They can be separated only by significant tearing of the flesh.....	0
The pieces comprising the cooked sample cohere fairly tightly and they can be separated only by moderate tearing of the flesh.....	1
The pieces comprising the cooked sample cohere slightly. They can be separated easily with slight or no tearing of the flesh.....	6
The pieces comprising the cooked sample show no tendency to cohere. They can be separated very easily.....	115

frozen block. Wrap individually or in single layer in aluminum foil. Place packaged portions on a wire rack suspended over boiling water in a covered container. Steam the packaged portions until the product is thoroughly heated, or (2) Cut and package the portions as described in subparagraph (1) of this paragraph. Place the packaged portions on a flat cookie sheet or shallow flat-bottom pan of sufficient size so that the packages can be spread evenly on the sheet or pan. Place pan and frozen contents in a properly ventilated oven heated to 400 degrees Fahrenheit and remove when the product is thoroughly heated.

#### LOT CERTIFICATION TOLERANCES

§ 52.3692 *Tolerances for certification of officially drawn samples.* The sample rate and grades of specific lots shall be

certified on the basis of the "Regulations Governing Inspection and Certification of Processed Fruits and Vegetables and Related Products" SRA-AMS 155, revised May 1957, effective July 1, 1957.

#### SCORE SHEET

§ 52.3693 *Score sheet for frozen fish blocks.*

Label.....  
Size and kind of container.....  
Container mark or identification.....  
Size of lot.....  
Number of blocks per master carton.....  
Size of sample.....  
Species of fish declared.....  
Actual net weight..... (lb.)

Factor	Standards score points	Sample Score
Appearance.....	25	
Uniformity.....	20	
Defects.....	40	
Character.....	15	
Total.....	100	

Flavor and odor.....  
Final grade.....

Dated: December 16, 1957.

[SEAL] ROY W. LENNARTSON,  
Deputy Administrator,  
Marketing Services.



## Department of Health, Education, and Welfare

### FOOD AND DRUG ADMINISTRATION

#### CANNED TUNA DEFINITION AND STANDARD OF IDENTITY HEARING ON USE OF WORDING "IN WATER" AND "DARK TUNA" ON LABELS:

A public hearing was held by the U. S. Food and Drug Administration (FDA), on a portion of its order establishing a definition and standard of identity for canned tuna.

The hearing, announced in the Federal Register of December 28, 1957, was held for the purpose of receiving evidence relevant and material to the objections to the requirement in the identity standard that the words "in water" are to be included in the name of the food when water is used as the packing medium and to the requirement for label declaration of tuna darker than Munsell value 5.3 as "dark tuna."

The effective date of the entire section of the standard of identity embodying the labeling requirements was suspended pending an order ruling on the objections. Except for this provision (section 37.1 (h)), the identity standard was scheduled to become effective February 13, 1958.

A notice of proposed rule making was published in the Federal Register of August 28, 1956, setting forth a proposed definition and standard of identity and a proposed standard of fill of container for canned tuna. An order acting on the proposals was published in the Federal Register of February 13, 1957. No objections were filed protesting the provisions of the standard of fill of container and accordingly that standard became fully effective August 13, 1957.

The notice of the hearing as it appeared in the December 28, 1957, Federal Register follows:

## DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

### Food and Drug Administration

[ 21 CFR Part 37 ]

[Docket No. FDC 64]

#### CANNED TUNA; DEFINITION AND STANDARD OF IDENTITY; LABEL STATEMENT OF OPTIONAL INGREDIENTS

##### NOTICE OF HEARING

A notice of proposed rule making was published in the FEDERAL REGISTER of August 28, 1956 (21 F. R. 6492), setting forth a proposed definition and standard of identity and a proposed standard of fill of container for canned tuna. An order acting on the proposals was published in the FEDERAL REGISTER of February 13, 1957 (22 F. R. 892). No objections were filed protesting the provisions of the standard of fill of container and accordingly that standard became fully effective August 13, 1957.

Objections were filed protesting those labeling provisions in the identity standard requiring the words "in water" to be included in the name of the food when water is used as the packing medium and requiring tuna darker than Munsell value 5.3 to be declared on the label as "dark tuna". Notice of these objections and of the stay of the provisions to which the objections were directed until final action

after a public hearing was published in the FEDERAL REGISTER of August 29, 1957 (22 F. R. 6961). Except for the provisions stayed, the identity standard is scheduled to become effective February 13, 1958. Since publication of the notice of objections, the National Canners Association, representing a substantial portion of the tuna-canning industry, has requested postponement of the effective date of the identity standard for 1 year. The need for the requested postponement was supported only with respect to the design and procurement of new labels. The labeling requirements of the identity standard are set out in § 37.1 (h). Postponement of those provisions of § 37.1 (h) that were not stayed, until final action is taken disposing of the objections to be taken up at the public hearing, will meet the needs set out in the request of the National Canners Association.

Now, therefore, pursuant to the authority vested in the Secretary of Health, Education, and Welfare by the Federal Food, Drug, and Cosmetic Act (secs. 401, 701, 52 Stat. 1046, 1055, as amended 70 Stat. 919; 21 U. S. C. 341, 371) and in accordance with the authority delegated to him by the Secretary (22 F. R. 1045), the Commissioner of Food and Drugs hereby extends the effective date of § 37.1 (h) of the definition and standard of identity for canned tuna until the effective date of the order ruling on the objections to be heard. Notice is hereby

given that a public hearing will be held for the purpose of receiving evidence relevant and material to the objections to the requirement in the identity standard for canned tuna that the words "in water" are to be included in the name of the food when water is used as the packing medium and to the requirement for label declaration of tuna darker than Munsell value 5.3 as "dark tuna".

The hearing will begin at 10 o'clock in the morning of January 29, 1958, in Room 3046, South Agriculture Building, 12th and Independence Avenue SW., Washington, D. C. All interested persons are invited to attend this hearing and present evidence. The hearing will be conducted in accordance with the rules of practice therefor.

Mr. Leonard D. Hardy is hereby designated as presiding officer to conduct the hearing, with full authority to administer oaths and affirmations and to do all other things appropriate to the conduct of the hearing. The presiding officer is required to certify the entire record of the proceeding to the Commissioner of Food and Drugs for action.

Dated: December 24, 1957.

[SEAL]

JOHN L. HARVEY,  
Deputy Commissioner  
of Food and Drugs.

NOTE: ALSO SEE COMMERCIAL FISHERIES REVIEW, NOVEMBER 1957, P. 60.



## Department of the Interior

### FISH AND WILDLIFE SERVICE

#### APPOINTMENT OF DIVISION CHIEFS ANNOUNCED:

The filling of five top posts in the newly reorganized United States Fish and Wildlife Service was announced December 23, 1957 by Commissioner of Fish and Wildlife Arnie J. Suomela.

The appointment of division chiefs in the Service's Bureau of Commercial Fisheries and Bureau of Sport Fisheries and Wildlife carries out changes in functions and organization of the Service as authorized by the Fish and Wildlife Act of 1956. All of the positions have been filled by the promotion of career employees.

In the Bureau of Commercial Fisheries (headed by Director Donald L. McKernan), Dr. Albert L. Tester, formerly director of the Service's Pacific Oceanic Fisheries Investigations at Ho-

lolulu, T. H., was selected as Chief of the new Division of Biological Research which will handle investigations pertaining to the anadromous fisheries, marine and inland fisheries, and the shellfish fisheries. Previously these activities were conducted by the Service's Branch of Fishery Biology.

Harold E. Crowther, formerly Coordinator of the Saltonstall-Kennedy Program work and in charge of setting up the Fisheries Loan Fund unit, becomes chief of the Division of Industrial Research and Services. This division has taken over the functions of the former Branch of Commercial Fisheries in the field of economics, exploratory fishing and gear research, dissemination of daily fishery market news, statistical canvasses and studies, market development activities, and technological research.

Ralph C. Baker, formerly assistant chief of the Service's Branch of Alaska Fisheries, is now head of the Division



of Resource Management. This organizational unit is responsible for the Alaska fishery and fur-seal programs, the Columbia River fishery development program, and the enforcement of laws and regulations relating to the management of commercial fisheries and marine mammals under international fishery conventions.

In the Bureau of Sport Fisheries and Wildlife (headed by Director Daniel H. Janzen), Robert M. Rutherford, formerly chief of the Branch of Federal Aid, is the new chief of the Division of Technical Services. This division is respon-

sible for the administration of the Pittman-Robertson wildlife and the Dingell-Johnson sport fish restoration programs, river basin activities, engineering, and realty services.

The Division of Sport Fisheries is headed by John S. Gottschalk, formerly assistant chief of the Federal Aid Branch of the Service. This division has charge of the operation of all the Service hatcheries and supervises the programs involving the management of the sport fish resources and the conduct of fundamental research on these species.



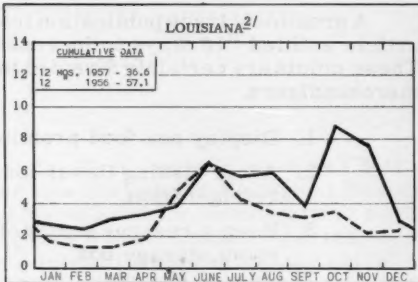
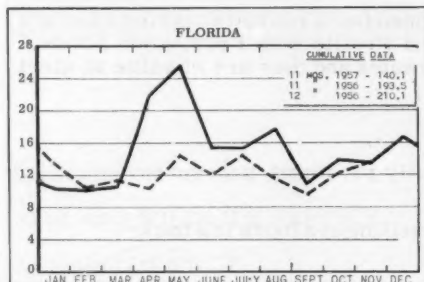
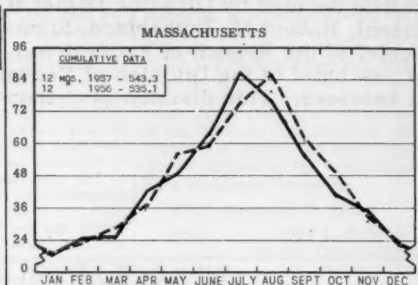
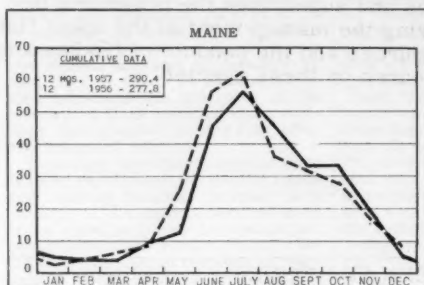
#### TIPS FOR RETAILING FROZEN SEA FOODS

A prominent trade publication featuring frozen foods recently carried a feature article entitled "10 Ways to Increase Sales and Profits with Frozen Sea Foods." These points are certainly directed to increase sales and they are of value to alert merchandisers.

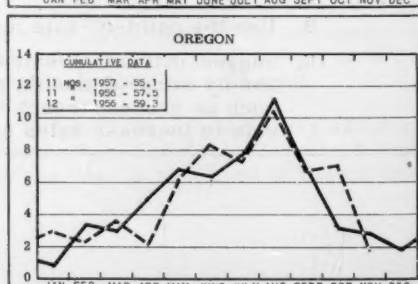
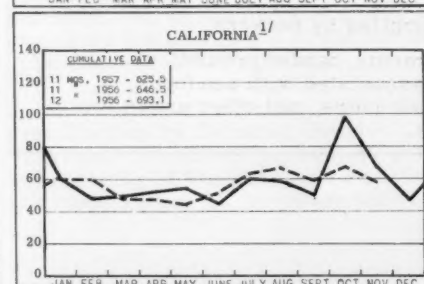
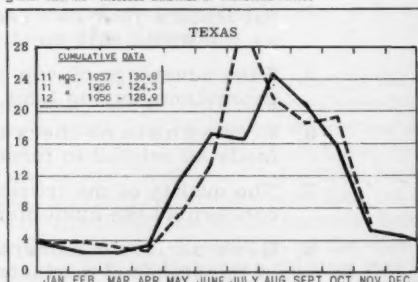
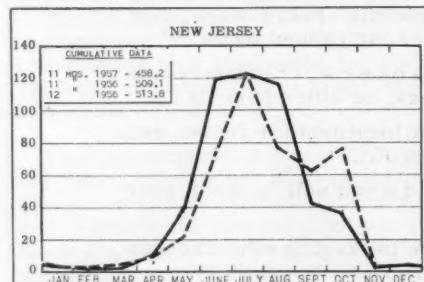
1. Display sea food prominently.
2. Avoid risking flavor loss--promptly put items under zero refrigeration.
3. Keep a reserve supply of the fast-selling sea foods in a back-room storage box.
4. Don't wait for the packers to come around with promotions, but feature your own sea food "specials" every week, just as you would with meat, vegetables, or canned foods.
5. Take advantage of any special packers' or industrywide promotions during Lent, Fish Week, or other periods.
6. Keep constant check on space allocations for frozen sea foods as related to turnover and profit.
7. The quality of the frozen sea foods you sell is much your concern as the customers'.
8. Give serious consideration to the packaging effectiveness of the sea-food products you handle.
9. Use the point-of-sale material supplied by packers.
10. Suggest in point-of-sale advertisements, banded promotions, and by word-of-mouth, products associated with sea foods, such as sauces, french fries, potato chips, and other products to increase sales and profits.



**CHART 1 - FISHERY LANDINGS for SELECTED STATES**  
In Millions of Pounds



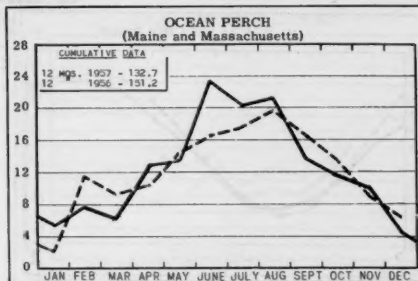
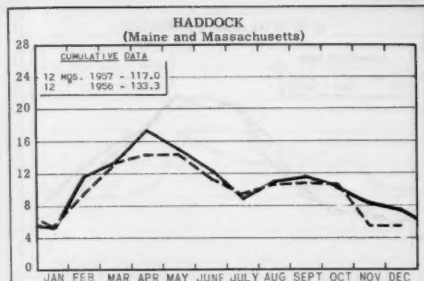
<sup>2/</sup>ONLY PARTIAL--INCLUDES LANDINGS AT PRINCIPAL PORTS.



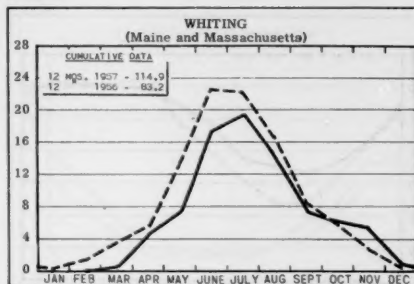
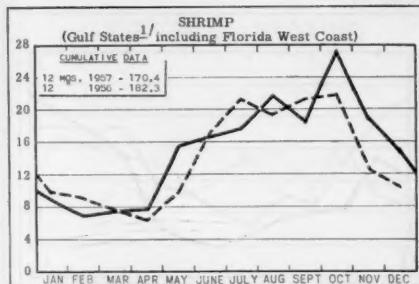
<sup>1/</sup>ONLY PARTIAL--INCLUDING PRODUCTION OF MAJOR FISHERIES AND MARKET FISH LANDINGS AT PRINCIPAL PORTS.

# CHART 2 - LANDINGS for SELECTED FISHERIES

In Millions of Pounds

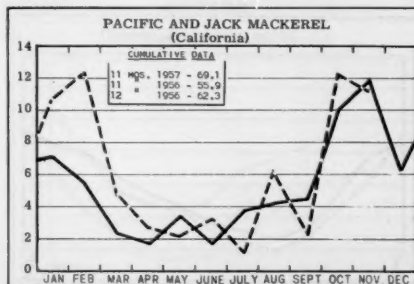
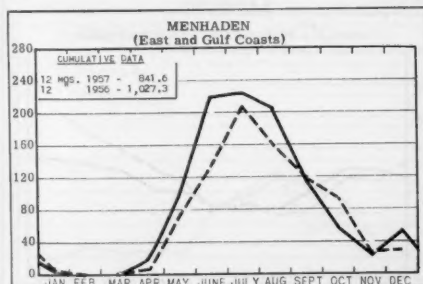


In Millions of Pounds

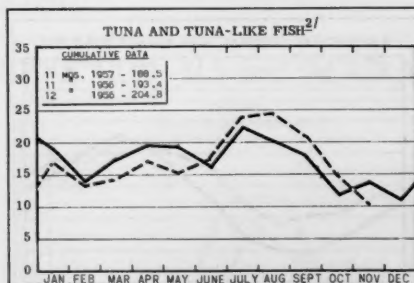
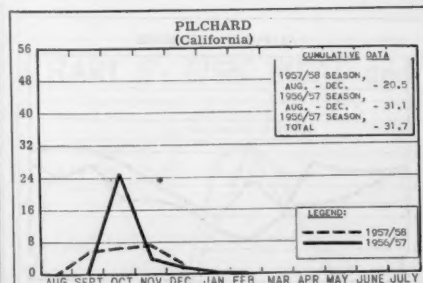


<sup>1/</sup>LA. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.

In Thousands of Tons



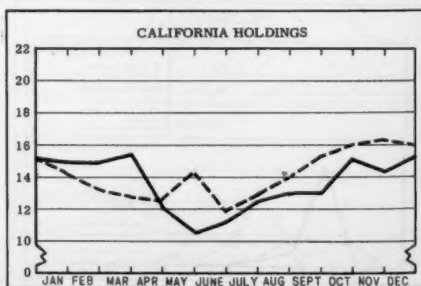
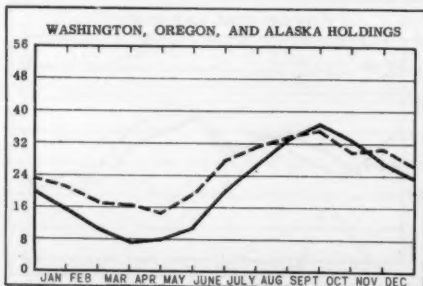
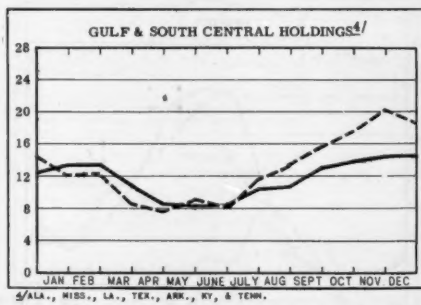
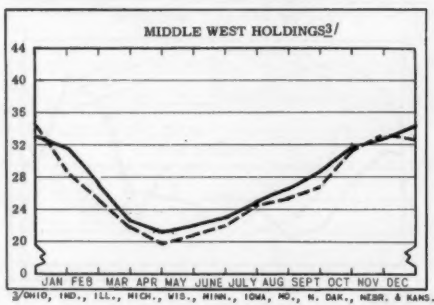
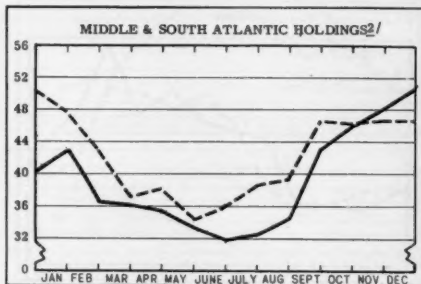
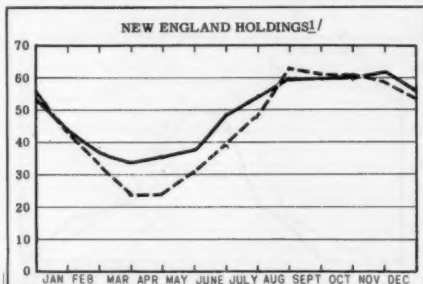
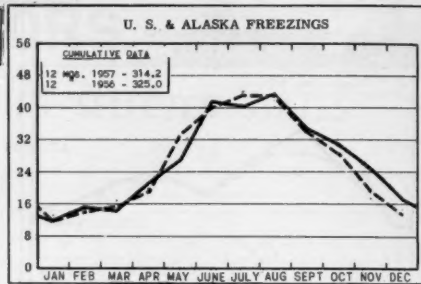
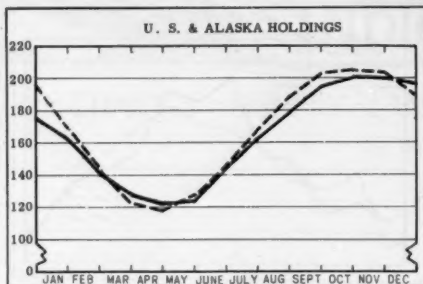
In Thousands of Tons



<sup>2/</sup>RECEIPTS BY CALIFORNIA CANNERIES, INCLUDING IMPORTS.

# CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS \*

In Millions of Pounds

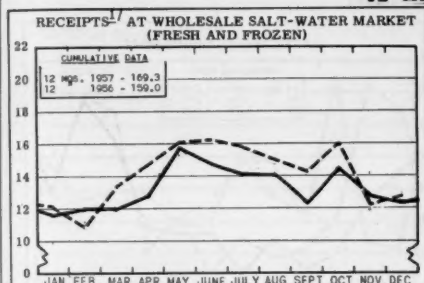


\*Excludes salted, cured, and smoked products.



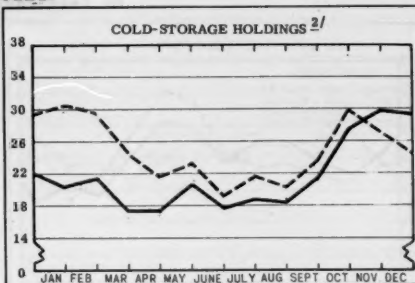
# CHART 4 - RECEIPTS and COLD-STORAGE HOLDINGS of FISHERY PRODUCTS at PRINCIPAL DISTRIBUTION CENTERS

In Millions of Pounds

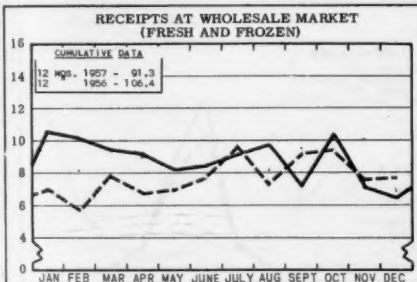


<sup>1/</sup>INCLUDE TRUCK AND RAIL IMPORTS FROM CANADA AND DIRECT VESSEL LANDINGS AT NEW YORK CITY.

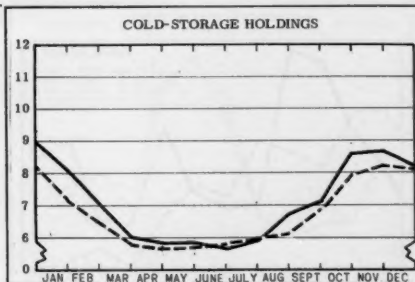
**NEW YORK CITY**



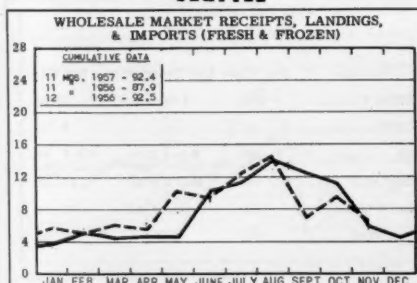
<sup>2/</sup>AS REPORTED BY PLANTS IN METROPOLITAN AREA.



**CHICAGO**

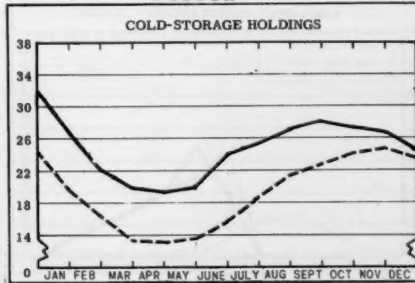


**SEATTLE**

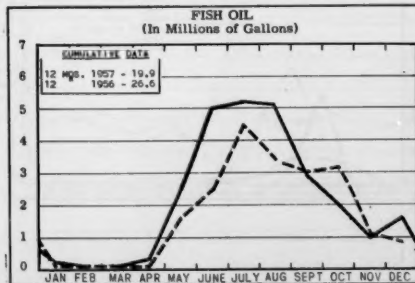
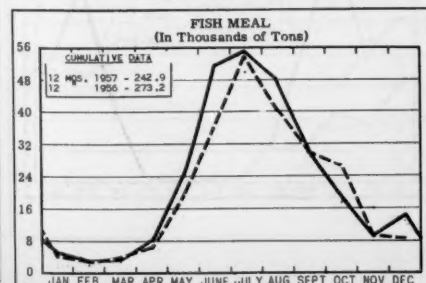


LEGEND:  
— 1957  
--- 1956

**BOSTON**

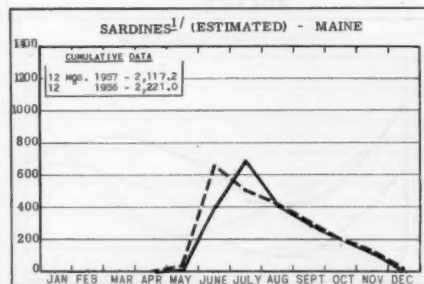
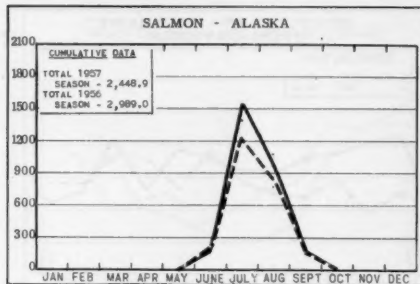
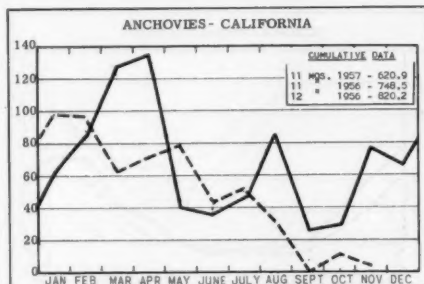
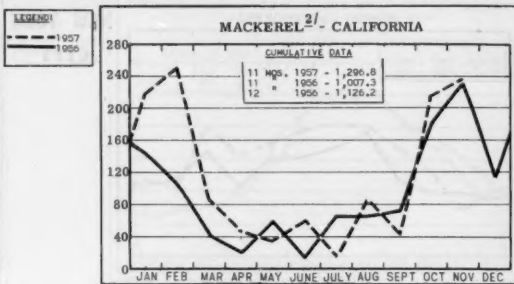
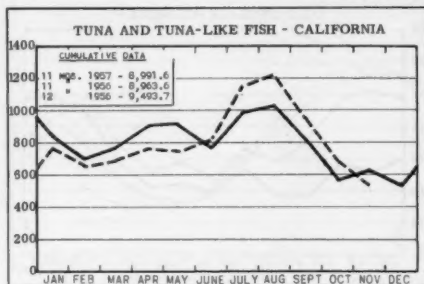


## CHART 5 - FISH MEAL and OIL PRODUCTION - U.S. and ALASKA



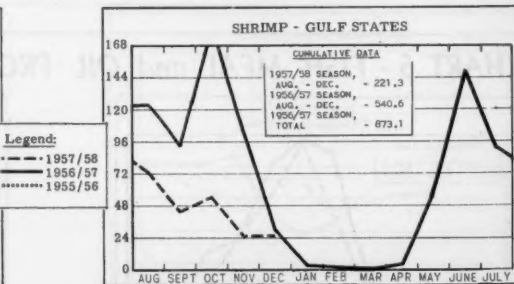
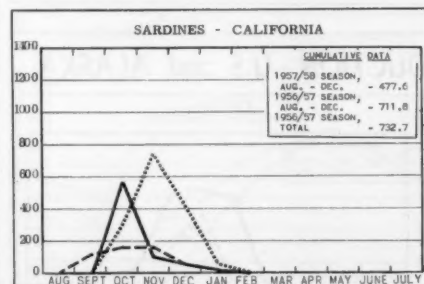
# CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

In Thousands of Standard Cases



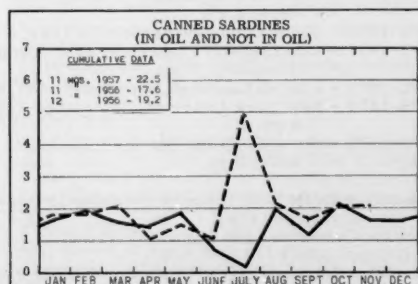
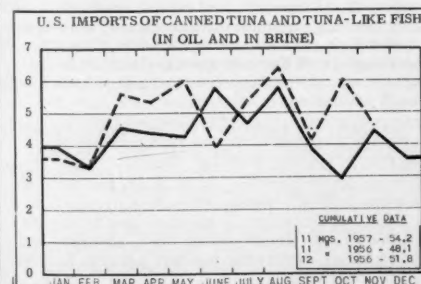
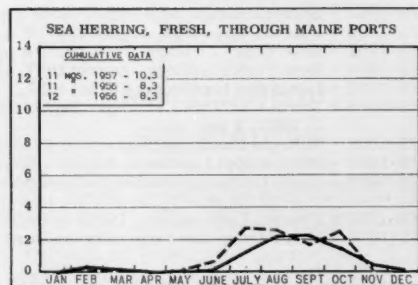
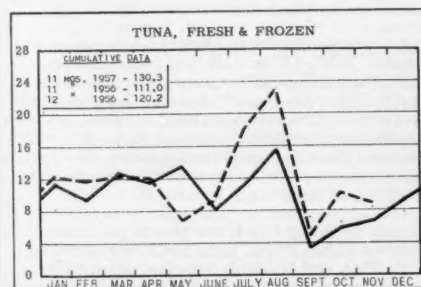
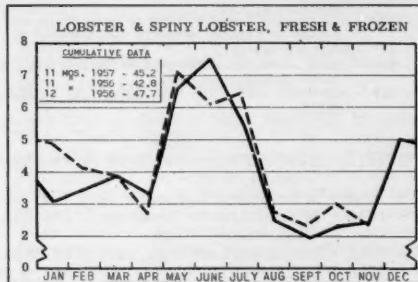
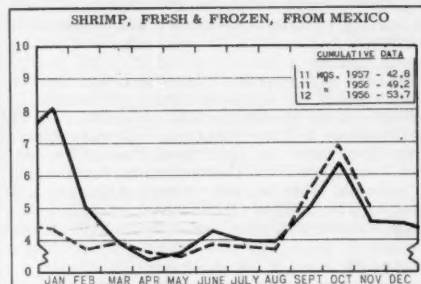
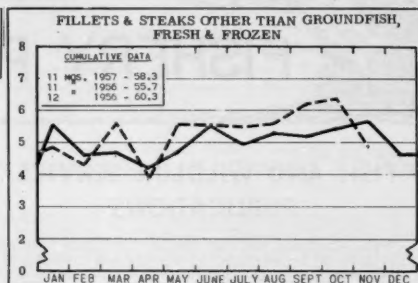
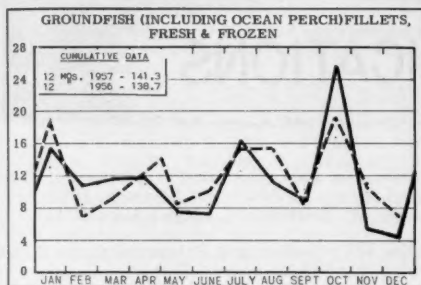
**STANDARD CASES**

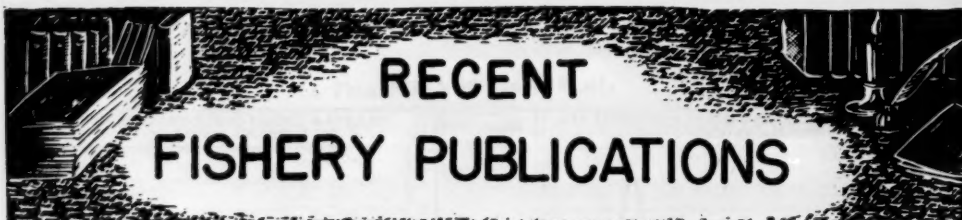
Variety	No. Cans	Can Designation	Net Wgt.
SARDINES .....	100	$\frac{1}{4}$ drawn	3 $\frac{1}{2}$ oz.
SHRIMP .....	48	--	5 oz.
TUNA .....	48	No. $\frac{1}{2}$ tuna	6 & 7 oz.
PILCHARDS .....	48	No. 1 oval	15 oz.
SALMON .....	48	1-pound tall	16 oz.
ANCHOVIES .....	48	$\frac{1}{2}$ lb.	8 oz.



# CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

In Millions of Pounds





# RECENT FISHERY PUBLICATIONS

## FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE DIVISION OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

- CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES AND ALASKA.
- SL - STATISTICAL SECTION LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
- WL - WILDLIFE LEAFLET.
- SSR - FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).
- SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.

Number	Title
CFS-1614	- Alaska Fisheries, 1956 Annual Summary, 8 pp.
CFS-1646	- Mississippi Landings, July 1957, 2 pp.
CFS-1648	- Massachusetts Landings, 1956 Annual Summary, 16 pp.
CFS-1653	- Louisiana Landings, July 1957, 2 pp.
CFS-1656	- California Landings, June 1957, 4 pp.
CFS-1658	- Middle Atlantic Fisheries, 1956 Annual Summary, 9 pp.
CFS-1659	- Ohio Landings, September 1957, 2 pp.
CFS-1660	- Florida Landings, August 1957, 6 pp.
CFS-1661	- New York Landings, July 1957, 4 pp.
CFS-1662	- New York Landings, August 1957, 4 pp.
CFS-1663	- Louisiana Landings, August 1957, 2 pp.
CFS-1665	- North Carolina Landings, September 1957, 3 pp.
CFS-1666	- Georgia Landings, September 1957, 2 pp.
CFS-1667	- Mississippi Landings, August 1957, 2 pp.
CFS-1668	- South Carolina Landings, September 1957, 2 pp.
CFS-1669	- Frozen Fish Report, October 1957, 8 pp.
CFS-1670	- New Jersey Landings, September 1957, 3 pp.
CFS-1671	- Shrimp Landings, July 1957, 6 pp.
CFS-1673	- California Landings, July 1957, 4 pp.
CFS-1674	- Rhode Island Landings, September 1957, 3 pp.
CFS-1675	- Maine Landings, September 1957, 3 pp.
CFS-1676	- New England Fisheries, 1956 Annual Summary, 7 pp.
CFS-1677	- Florida Landings, September 1957, 6 pp.
CFS-1679	- New York Landings, September 1957, 4 pp.
CFS-1682	- North Carolina Landings, October 1957, 3 pp.

Wholesale Dealers in Fishery Products (Revised):  
SL-10 - Maryland, 1957.  
SL-21 - California, 1957.

WL-391 - Selected List of Fish and Wildlife Materials for Conservation Education, 2 pp.

SSR-Fish. No. 227 - English Translations of Fishery Literature, Additional Listings, 1957, by Leslie W. Scattergood, 66 pp., August 1957.

Sep. No. 497 - Sodium and Potassium in the Edible Portions of 34 Species of Fish.

Sep. No. 498 - Comparative Keeping Quality, Cooling Rates, and Storage Temperatures of Haddock Held in Fresh-Water Ice and in Salt-Water Ice.

Sep. No. 499 - Research in Service Laboratories (January 1958): Contains these articles--  
"Progress on Studies in Utilization of Fish-Oil Derivatives in Ore Flotation;" "Development of Objective Tests for Quality of Fresh, Frozen and Processed Fish (Nontechnical Summary);" "Technical Note No. 42 - Keeping Quality and Rate of Freezing of Cooked Deep-Sea Lobster Meat Frozen in Cans;" and "Tests on Storage of Frozen Shrimp Show that Proper Packaging 'Pays Off'."

THE FOLLOWING SERVICE PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

Boston Fishery Products Monthly Summary, November 1957, 15 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Landings and ex-vessel prices by species for fares landed at the Boston Fish Pier and sold through the New England Fish Exchange; and Boston frozen fishery products prices to primary wholesalers; for the month indicated.

California Fishery Products Monthly Summary, October 1957, 10 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) California cannery receipts of raw tuna and tunalike fish, herring, mackerel, anchovies, and squid; pack of canned tuna, herring, mackerel, anchovies, and squid; market fish receipts at San Pedro, Santa Monica, San Diego, and Eureka areas; California imports; canned fish and frozen fish prices; for the month indicated.

(Chicago) Monthly Summary of Chicago's Fresh and Frozen Fishery Products Receipts and Wholesale Market Prices, October 1957, 12 pp. (Market News Service, U. S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6, Ill.) Receipts at Chicago by species and by states and provinces; fresh-water fish, shrimp, and frozen fillet wholesale market prices; for the month indicated.



Gulf Monthly Landings, Production, and Shipments of Fishery Products, November 1957, 5 pp. (Market News Service, U. S. Fish and Wildlife Service, 609-611 Federal Bldg., New Orleans 12, La.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; and wholesale prices of fish and shellfish on the New Orleans French Market; for the month indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, November 1957, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 So. King St., Hampton, Va.) Fishery landings and production for the Virginia areas of Hampton Roads, Lower Northern Neck, and Eastern Shore; the Maryland areas of Crisfield, Ocean City, and Cambridge; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data; for the month indicated.

(Seattle) Monthly Summary - Fishery Products, October 1957; November 1957; 7 pp. each. (Market News Service, U. S. Fish and Wildlife Service, Pier 42 South, Seattle 4, Wash.) Includes landings and local receipts, with ex-vessel and wholesale prices in some instances, as reported by Seattle and Astoria (Ore.) wholesale dealers; also Northwest Pacific halibut landings; for the months indicated.

Production of Fishery Products in Selected Areas of Virginia, Maryland, and North Carolina, 1956 (As Reported to Hampton Fishery Market News Office), by William N. Kelly, 18 pp., processed. (Available free from the Market News Service, U. S. Fish and Wildlife Service, 18 S. King St., Hampton, Va.) A summary of commercial landings of fish and shellfish and the production of crab meat and shucked oysters as reported by producers and wholesalers from selected principal fishing localities of Virginia, Maryland, and North Carolina. The statistics contained in this annual summary represent the approximate commercial fisheries production only and do not represent complete commercial landings or production for a given area, individual State, or the Chesapeake Bay area as a whole. However, the statistics do give an indication as to the trend in fisheries production for the specific areas designated and do reflect the over-all production trend by species, localities, and by states.

Special Reports on Halibut and Salmon Prices for Alaska, Seattle, and British Columbia, 1957-1956, 1 p. each, processed. (Available free from the Market News Service, U. S. Fish and Wildlife Service, Pier 42 South, Seattle 4, Wash.) Certain Supplementary Market News Reports giving data for the past two to four years for the halibut and troll salmon fishery. Seattle Ex-Vessel Halibut Prices, 1954-1957, shows the ex-vessel weekly range of halibut prices at Seattle and weekly landings at that port for 1954-1957 (Supplementary Market News Report, November 4, 1957). Seattle Salmon Exchange Troll Salmon Prices, 1956-1957, shows the ex-vessel weekly range of troll salmon prices at Seattle and weekly landings at that port for 1956-1957 (Supplementary Market News Report, November 8, 1957). Alaska Ex-Vessel Halibut Prices, 1956-1957;

Alaska Troll Salmon Ex-Vessel Prices, 1956-1957, shows the ex-vessel weekly range of prices in Alaska by ports, 1956-1957 (Supplementary Market News Report, November 13, 1957). United States and Canadian Ex-Vessel Halibut Prices at Prince Rupert, 1956-1957; Canadian Ex-Vessel Halibut Prices at Vancouver, British Columbia, 1956-1957, shows the ex-vessel weekly range of halibut prices at Prince Rupert and Vancouver, British Columbia, 1956-1957 (Supplementary Market News Report, November 18, 1957).

THE FOLLOWING SERVICE PUBLICATIONS ARE FOR SALE AND ARE AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, WASHINGTON 25, D. C.

Fecundity of North American Salmonidae, by George A. Rounsefell, Fishery Bulletin 122 (From Fishery Bulletin of the Fish and Wildlife Service, vol. 57), 20 pp., illus., printed, 20 cents, 1957.

Fecundity of the Pacific Sardine (SARDINOPS CAERULEA), by John S. MacGregor, Fishery Bulletin 121 (From the Fishery Bulletin of the Fish and Wildlife Service, vol. 57), 26 pp., illus., printed, 25 cents, 1957.

Growth Rate of Browns Bank Haddock, by John P. Wise, Research Report 50, 15 pp., illus., printed, 1957, 10 cents. The objective of this paper is to present the results of a study of the population dynamics of the haddock stock of Browns Bank. A study of the growth rate of Browns Bank haddock, by a method of back-calculations from haddock scales taken from fish that ranged in age from 4 to more than 10 years old, reveals that the growth rate is considerably slower than that for haddock on Georges Bank, but faster than that previously determined for haddock from Nova Scotia.

## MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATION OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

### ALMANAC:

The American Ephemeris and Nautical Almanac for the Year 1959, 589 pp., printed, \$4.25. Nautical Almanac Office, U. S. Naval Observatory, Washington, D. C. (For sale by Superintendent of Documents, Government Printing Office, Washington 25, D. C.)

### ARGENTINA:

La Pesca en la Republica Argentina Durante el Año 1952 (The Fish of the Republic of Argentina during the Year 1952), by Rogelio B. Lopez, 24 pp., illus., printed. (Reprinted from Revista del Museo Municipal de Ciencias Naturales y Tradicional de Mar del Plata, volume 1, entrega 2, pp. 26-49, 6 figs.) Mar del Plata, Republica Argentina, Diciembre 1954.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

#### AUSTRALIA:

Australian Fisheries Statistics (excluding Whaling and Pearling Statistics), 1951/52-1955/56, 54 pp. of tables, processed. Fisheries Division, Department of Primary Industry, Canberra, Australia, September 1, 1957. This report, which is all statistical, covers Australian statistics on the following fisheries production by states, species groups, and most important commercial species; vessels and equipment used and number of persons engaged in the fisheries; fish processing; imports of fresh or refrigerated fish and shellfish for all Australia as well as for selected areas; imports of smoked, dried, and salted fish; imports of canned herring, salmon, sardines, and other canned fish and shellfish; potted or concentrated fish, including extracts and caviars; imports of fishery products from principal foreign sources; and exports of oysters, crustaceans, and canned fish and shellfish.

Manufacturing Industries, 1955-56, No. 23--Meat and Fish Preserving, by S. R. Carver, 9 pp., processed. Commonwealth Bureau of Census and Statistics, Canberra, Australia, September 17, 1957. Contains a summary for the years 1938-39, 1945-46, and 1953-54 to 1955-56 of the principal statistics of the factories in Australia engaged in meat and fish preserving. Also contains statistics on average salaries, output, and production; quantity and value of the principal articles produced; number of persons employed in each factory; and imports and exports of canned fishery products.

Report by the Chief Secretary on the Fisheries in New South Wales, for the Year Ended 30th of June, 1955, 38 pp., illus., printed. Government Printer, Sydney, New South Wales, Australia, 1956.

#### BYPRODUCTS:

"Reduction Industry in B. C.," by L. G. Swann, article, *Trade News*, vol. 10, no. 4, October 1957, pp. 3-5, illus., printed. Department of Fisheries, Ottawa, Canada. Describes the operation of fish reduction plants in British Columbia which utilize huge catches of Pacific herring. In all reduction plants the fish travels through the plant in planned progression from the fish boat or packer, until it emerges in bags as meal or into tanks as oil and condensed fish solubles. This article describes each step in the reduction process, the improved techniques, and the former and present uses of the products produced in fish reduction plants.

#### CANADA:

Fisheries Statistics of Canada, 1956 (British Columbia), 14 pp., illus., printed in French and English, 25 Canadian cents. Queen's Printer and Controller of Stationery, Ottawa, Canada, 1957. Contains tables giving the quantity and value of fishery products landed in British Columbia in 1949-56, by species and by fisheries districts; quantity and value of manufactured fishery products for 1955-56; capital equipment in the primary fisheries operations; and the number of fishermen engaged in the primary fisheries operations.

Fisheries Statistics of Canada, 1955 (Quebec), 73 pp., illus., printed in French and English, 50 Canadian cents. Queen's Printer and Controller of Stationery, Ottawa, Canada, 1957. Consists of tables giving the quantity and value of the principal species of fish and shellfish in Quebec in 1952-55; quantity and value of landings by species and fisheries districts, 1954-55; quantity and value of manufactured fishery products by species and fisheries districts, 1954-55; capital equipment in the primary fisheries operations by fisheries districts, 1954-55; and number of persons engaged in the fisheries by fisheries districts, 1954-55.

Fisheries Statistics of Canada, 1956 (Prince Edward Island), 22 pp., illus., printed in French and English, 25 Canadian cents. Queen's Printer and Controller of Stationery, Ottawa, Canada, 1957. Contains tables giving the value of fishery products landed in Prince Edward Island in 1949-1956, by species; quantity and value by species and fisheries districts; quantity and value of manufactured fishery products by species and fisheries districts, 1955-56; capital equipment in the primary fisheries operations; and the number of fishermen engaged in the primary fisheries operations.

Progress Reports of the Atlantic Coast Stations, no. 66, 26 pp., illus., printed in French and English. Queen's Printer and Controller of Stationery, Ottawa, Canada, September 1957. Contains the following articles: "An Experimental Mechanical Shellfish-Digger," by L. M. Dickie and J. S. MacPhail; "Frozen Storage of Plaice for Subsequent Thawing and Filleting," by W. J. Dyer, W. A. MacCallum, and Doris I. Fraser; "Chlorination in Fish Plants," by H. P. Dussault; "Changes Occurring in the Fat during the Processing of Salt Fish," by Aime Cardin and M. A. Bordeleau; "Two Varieties of Redfish in the Newfoundland Area," by W. Templeman and E. J. Sandeman; and "How Temperature and Crowding Affect the Holding of Lobsters in Artificial Sea Water," by D. G. Wilder and D. W. McLeese.

Tenth Annual Report of the Fisheries Prices Support Board for the Year 1956-57, 9 pp., printed. Queen's Printer and Controller of Stationery, Ottawa, Canada, 1957. This report covers the Fisheries Prices Support Act; the Canadian fisheries in 1956; the marketing of freshwater and saltwater fishery products in 1956; and Board activities in fisheries salt assistance, the fishermen's indemnity plan, and research.

#### COMMISSIONS:

Gulf States Marine Fisheries Commission Eighth Annual Meeting (Meeting Minutes), 49 pp., processed. Gulf States Marine Fisheries Commission, 312 Audubon Bldg., New Orleans 16, La. The minutes of the Commission's eighth annual meeting which was held in Mobile, Ala., on October 10-11, 1957. Contains resumes of fisheries activities reports for the year 1956-57 for Alabama, Florida, Louisiana, Mississippi, and Texas. The following surveys are discussed: Aransas Bay shrimp; industrial waste control;

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Mesquite Bay project; mud shell resource; Sabine Lake ecological study; Galveston Bay, Matagorda Bay, and Lower Laguna Madre projects; Gulf oyster investigations; Gulf fisheries exploration and gear research; Gulf fishery statistical program; and Gulf fisheries investigations. Reports from some of the representatives attending the meetings are also presented.

#### DEHYDRATION:

"Some Recent Work on Dehydration in the United Kingdom," by D. G. V. Gooding and E. J. Rolfe, article Food Technology, vol. 11, June 1957, pp. 302-306, printed, Institute of Food Technologists, 176 W. Adams St., Chicago, Ill.

#### EXPORTS:

Schedule B-Statistical Classification of Domestic and Foreign Commodities Exported from the United States, January 1, 1958 Edition, 586 pp., printed, \$6.00 domestic and 7.50 foreign. Foreign Trade Division, Bureau of the Census, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C.) Schedule B is the statistical classification of commodities exported from the United States used in compiling the official United States foreign trade statistics. It shows for each commodity description (including fishery products and related commodities) the commodity code numbers to be shown on shipper's export declaration forms. In addition it shows the country designations, customs districts, ports, quantity and conversion factors, economic classes, group and subgroup classifications, and units of quantity used in compiling the statistics. Schedule B is printed in looseleaf form and its cost includes supplemental bulletins and pages to keep it up to date for an indefinite period of time.

#### FAO:

Expanded Technical Assistance Program (Report by the Director-General), Item 7(b) of the Provisional Agenda, C 57/30, 17 pp., printed. Food and Agriculture Organization of the United Nations, Rome, Italy, August 30, 1957.

Report of the General Fisheries Council for the Mediterranean to the FAO Conference (Period from 1 October 1955 to 1 October 1957), Item 7 of the Provisional Agenda, C 57/28, 10 pp., printed. Food and Agriculture Organization of the United Nations, Rome, Italy, September 30, 1957.

The State of Food and Agriculture, 1957, 171 pp., illus., printed, US\$2. Food and Agriculture Organization of the United Nations, Rome, Italy. (For sale by International Documents Service, Columbia University Press, 2960 Broadway, New York 27, N. Y.)

The Work of FAO, 1956-1957 (Report to the Director-General), 92 pp., printed. Food and Agriculture Organization of the United Nations, Rome, Italy, June 1957.

#### GEAR:

Mediterranean Trawling, Preliminary Observa-

tions in the Study of Italian Trawl Nets, Studies and Reviews No. 2, 20 pp., illus., processed. GFCM Secretariat, Food and Agriculture Organization of the United Nations, Rome, Italy, September 1957. Presents the text of a working paper entitled "Mediterranean Trawling, a Proposed Rational Study with a View to Improved Efficiency," by H. Kristjonsson, which was discussed at the 4th meeting of the General Fisheries Council for the Mediterranean at Istanbul on September 17-22, 1956. This paper stressed that it would be of great advantage to improve the efficiency of the Mediterranean trawl through a rational study, and proposed a working plan in this connection. Some of the points included in this plan of work have been implemented, and this report presents the objectives and summary of some preliminary observations.

Some Problems in the Theory of the Capture of Fish by Gill Nets, by N. N. Andreev, 30 pp., processed. (Reprinted from Proceedings of the All-Union Scientific Research Institute of Sea Fishery and Oceanography, Vol. XXX, 1955, pp. 109-127.) Ministry of Agriculture, Fisheries and Food, Fisheries Laboratory, Lowestoft, England.

#### GERMAN FEDERAL REPUBLIC:

Jahresbericht über die Deutsche Fischerei, 1956 (Yearbook of the German Fisheries, 1956), 304 pp., illus., printed in German, DM20 (US\$5). Verlag Gebr. Mann, Berlin-Schöneberg, Germany, October 1957.

#### HALIBUT:

Regulation and Investigation of the Pacific Halibut Fishery in 1956, Report of the International Pacific Halibut Commission No. 25, 27 pp., illus., printed. International Pacific Halibut Commission, Seattle, Wash., 1957. A brief report of activities of the Commission during 1956 which discusses the historical background of the Commission, 1956 regulations, statistics of the fishery, catch per unit of fishing effort, multiple open seasons, composition of catches, growth rate studies, tagging experiments, and studies of subcommercial size halibut. Also contains an article entitled "Investigations of Small Halibut in September 1955," by William H. Hardman and G. Morris Southward.

#### HERRING:

The Food and Feeding Habits of Larval and Post-Larval Herring in the Northern North Sea, by R. N. Bhattacharyya, Marine Research No. 3--1957, 19 pp., illus., printed, 7s. (68 U.S. cents). Her Majesty's Stationery Office, Edinburgh, Scotland, 1957.

Prospects for the 1957/58 Herring Fishing Season, Circular No. 45, 7 pp., illus., processed. Fisheries Research Board of Canada, Pacific Biological Station, Nanaimo, B.C., Canada, July 1957.

#### JAPAN:

Collected Reprints, 1956 (from the Tokai Regional Fisheries Research Laboratory), 155 pp., illus., printed in Japanese with English summaries.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Tokai Regional Fisheries Research Laboratory, Tsukishima, Chuo-ku, Tokyo, Japan. Contains, among others, the following reprints of articles published by Laboratory scientists other than in the publications of the Laboratory: "Estimation of Annual Catches of Sardine and Anchovy in Japan, 1926-50--Using the Amounts of Processed Iwashi Products;" "Resistance of Plane Net Against Flow of Water. III--Effect of Kind of Fibers on the Resistance of Net;" "Resistance of Plane Net Against Flow of Water. V--On the Inclination of Net in a Current;" "An Attempt at Measuring Deformation of the Set Net by a Fish Finder (Preliminary Report);" "On the Denaturation of Fish Muscle Protein by Dehydration;" "On the Extractability of Muscle Proteins of Marine Animals;" "Vitamin A in Fish Meat. V--Relation between Vitamin A and Carotenoid Pigment in the Skin of Mackerel;" "The Vitamin B<sub>6</sub> Content of Fish Meat;" "Studies on the Economical Manufacture of Vitamin A Concentrate from Fish Liver Oil. VII--Esterification of Vitamin A Concentrate. 2--Acetylation with Ketene;" "Studies on the Preservation of Fish Cakes. IV--Factors Involved in Preservative Effect of Carbon Dioxide;" "Photomicrographic Examination of Fish Meat Jelly;" and "Studies on Utilization of the Liver Oil of Deep Sea Sharks. XII--Preparation of Polymerized Product from Squalene. (1) Polymerization of Squalene Using Acid Clay as Catalyst."

General Aspect of Trawl Fisheries in the Japan Sea, by Gendi Kato, Ichiro Yamanaka, Akira Ouchi, and Tetsuo Ogata, Bulletin of the Japan Sea Regional Fisheries Research Laboratory, No. 4, 331 pp., printed in Japanese with a separate 11-page summary in English, Japan Sea Fisheries Research Laboratory, Niigata, Japan, October 1956.

#### MULLET:

Fluctuations in Catch of the Yellow-Eye Mullet, ALDRICHETTA FORSTERI (Cuvier & Valenciennes), (Mugilidae) by J. M. Thomson, Division of Fish and Oceanography Report 1, 15 pp., illus., processed. Marine Biological Laboratory, Cronulla, Sydney, Australia, August 1956.

#### NETHERLANDS:

Onderzoek Naar de Bedrijfsresultaten van de Kleine-Zeevisserij in 1954 en 1955 (Research Results on Cost of Production in the Coastal Fisheries in 1954 and 1955), Rapport No. 256, 101 pp., illus., processed in Dutch. Lanbouweconomisch Instituut, s-Gravenhage, Netherlands.

#### NYASALAND:

Annual Report of the Department of Game, Fish and Tsetse Control for the Year 1956, 18 pp., printed. The Government Printer, Zomba, Nyasaland, 1957. The section on fisheries discusses the state of the fish stocks, the non-African fishery, the African fishery, fish trade, developmental and experimental work, fisheries research organization, trout fishing, and fish farming. Statistics are also given on landings of the different species of fish in the non-African and African fisheries.

#### OCEANOGRAPHY:

Heat Transport of the Florida Current (Final Report submitted to National Science Foundation), by Frank Chew, L. P. Wagner, and Robert C. Work, Report 57-21, 39 pp., illus., processed. The Marine Laboratory, University of Miami, Coral Gables, Fla., September 1957.

#### OHIO:

The Fishes of Ohio, by Milton B. Trautman, 700 pp., illus., printed, \$6.50 (plus 30 cents postage; Ohio residents, 20 cents more for sales tax). The Ohio State University Press, Columbus 10, Ohio. Contains 7 full-page color plates showing 21 species of fishes, more than 800 black and white illustrations, including 100 detailed original drawings of fishes to scale and 172 distribution maps. Includes keys for identification of all fishes of Ohio and many species in neighboring states. Has chapters on common and scientific names of fishes, fish hybridization, collecting and preserving fish, changes in land use and stream conditions since 1750, factors influencing fish distribution and abundance, and reasons for changes in fish distribution and abundance since 1750.

#### PHYSIOLOGY:

The Physiology of Fishes. Vol. 1--Metabolism, edited by Margaret E. Brown, printed, \$12. Academic Press Inc., 111 Fifth Ave., New York 3, N. Y. The first of two volumes containing reviews of what is known at present of fish physiology. The papers cover respiration, the cardiovascular and digestive systems, endocrine organs, reproduction, growth studies, and biochemical composition of fish.

The Physiology of Fishes: Vol. 2--Behavior, edited by Margaret E. Brown, 537 pp., illus., printed, \$11. Academic Press Inc., 111 Fifth Ave., New York 3, N. Y., 1957.

#### PLANKTON:

Pelagic Polychaetes of the Pacific Ocean, by R. Phillips Dales, 72 pp., illus., printed, \$3. (Reprinted from Bulletin of the Scripps Institution of Oceanography, vol. 7, no. 2, pp. 99-168.) University of California Press, Berkeley 4, Calif., 1957.

The South African Pilchard (SARDINOPS OCELLATA) and Maasbanker (TRACHURUS TRACHURUS)--Variations in the Phytoplankton of the St. Helena Bay Area During 1954, by B. v. D. de Jager, Investigational Report No. 25, 78 pp., illus., printed. (Reprinted from Commerce and Industry, April 1957.) Division of Fisheries, Beach Road, Sea Point, Cape Town, Union of South Africa, 1957.

#### PRESERVATION:

Bulletin of the Japan Sea Regional Fisheries Research Laboratory, Fisheries Agency, No. 5, 109 pp., illus., printed in Japanese with summaries in English. Japan Sea Regional Fisheries Research Laboratory, Niigata, Japan, March 1957. Contains the following two articles: "I. A study on the Freshness of Fish Meat with Special Reference to the Determination



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of Rigor Mortis," and "II. A Study on the Vacuum and the Grade of Tomato-Sardine for the Export Inspection;" both by Elizaburo Noguchi.

#### PRESERVATION BY IRRADIATION:

"Food Irradiation Makes Strides," by Lt. Col. George E. Danald, article, Food Engineering, vol. 29, no. 12, December 1957, pp. 57-59, illus., printed, single copy \$1.00. McGraw-Hill Publishing Co., Inc., 330 W. 42nd St., New York 36, N. Y. Discusses the progress highlights of the project on radiation and preservation of foods undertaken by the U. S. Quartermaster Corps' Food and Container Institute. The summarized accomplishments of the last two years of research cover effects of radiation on foods; tests with human volunteers to establish wholesomeness and nutritional adequacy of irradiated foods; packaging; and radiation sources. Among the fishery products mentioned as included in the tests are oysters, shrimp, halibut, cod cakes, and cod.

#### RECIPES:

The Tuesday Book of Fish Recipes, compiled by Jean Conll, written by Nan van den Hoek, 31 pp., illus., printed. The British Trawlers' Federation, Ltd., Hull, England. A booklet of fish recipes, beautifully illustrated in color and prepared for distribution by retail fish dealers, suggesting that Tuesday be chosen as a second fresh-fish day. These recipes have been carefully selected for variety, economy, and simplicity. In addition to the recipes for cooking cod, haddock, halibut, and other fish, suggestions are given for buying wisely. Instructions are also given for keeping fish until ready for use, and the preparation and basic ways of cooking fish.

#### SALMON:

"Biology of the Salmon," by A. E. J. Went, article, Nature, vol. 180, no. 4590, October 19, 1957, pp. 789-790, printed. St. Martin's Press, Inc., 103 Park Ave., New York 17, N. Y. The author describes his paper, entitled "Salmon Investigations in Ireland, with Particular Reference to the River Shannon," which opened the symposium on the biology of the salmon, held in Dublin on September 10. The author then describes the other papers which composed the symposium.

Pacific Salmon--The Table of Hatchings and Re-leasings Number in Each River System in Hokkaido, 1927-1955, 91 pp., printed in Japanese and English. Hokkaido Salmon Hatchery, Nakonoshima, Sapporo, Hokkaido, Japan, 1956.

#### SARDINES:

The South African Pilchard (SARDINOPS OCELANATA)--Size Composition of the Commercial Catches, 1950-55, by D. H. Davies, Investigational Report No. 26, 59 pp., illus., printed. (Reprinted from Commerce and Industry, May 1957.) Division of Fisheries, Beach Road, Sea Point, Cape Town, Union of South Africa.

Standardization of Biometric and Observation Methods for Clupeidae (especially SARDINA

PILCHARDUS) Used in Fisheries Biology, Studies and Reviews No. 1, 47 pp., illus., processed. GFCM Secretariat, Food and Agriculture Organization of the United Nations, Rome, Italy.

#### SCALLOPS:

Offshore Scallop Explorations--1957, by G. M. Somerville and L. M. Dickie, General Series Circular No. 30, 4 pp., illus., printed. Fisheries Research Board of Canada, Biological Station, St. Andrews, N. B., Canada. Describes scallop explorations during 1957 which discovered two new commercially-valuable beds on the southern part of St. Pierre Bank. In referring to the larger of the new beds, the authors believed "that fishing on this bed now is profitable--better than on Georges Bank. But the bed is small so it seems likely that catches will soon fall to Georges Bank levels if it is fished intensively. However, there are several age-classes represented in the population and growth is fairly fast. It is, therefore, likely that good catches can be made there for a short time each year for several years." The survey also included areas off Nova Scotia where scallops were found. The authors stated that "In general Nova Scotia banks do not support large concentrations of scallops. Large boats would not find them worth fishing as long as Georges Bank and St. Pierre Bank stocks are available. However, it is possible that small boats, such as those employed in long-lining, or engaged in scalloping in the Bay of Fundy, could make profitable catches."

A Review of the Scallop Fishery, by L. A. St. Leger, 3 pp., printed. (Reprinted from the Tasmanian Journal of Agriculture, August 1957, pp. 275-277.) Government Printer, Tasmania. Presents the history of the scallop fishery of Tasmania as well as the present condition of the fishery and predictions for its future.

#### SCULPINS:

Classification, Variation, and Distribution of the Sculpins, Genus COTTUS, Inhabiting Pacific Slope Waters in California and Southern Oregon, with a Key to the Species, by C. Richard Robins and Robert Rush Miller, 21 pp., illus., printed. (Reprinted from California Fish and Game, vol. 43, no. 3, July 1957, pp. 213-233.) The Marine Laboratory, University of Miami, Coral Gables, Fla.

#### SHARKS:

"Studies on Utilization of the Liver Oil of Deep Sea Sharks," by Hideo Higashi, Shigeo Iseki, and Motoaki Asano, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 22, no. 6, 1956, pp. 378-382, illus., printed in Japanese with summary in English. Japanese Society of Scientific Fisheries, Tokyo, Japan.

A Study of the Sharks of the Suborder Squaloidea, by Henry B. Bigelow and William C. Schroeder, Bulletin of the Museum of Comparative Zoology at Harvard College, Vol. 117, No. 1, 150 pp., illus., with four photographic plates, printed. Museum of Comparative Zoology, Harvard College, Cambridge, Mass., August 1957.

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#### SHRIMP:

The Commercial Shrimp Industry of Florida, by Clarence P. Idyll, Educational Series No. 6, 30 pp., illus., printed (originally issued March 1950, reissued August 1957). State Board of Conservation, Tallahassee, Fla. The purpose of this report when it was originally issued in 1950 was to summarize knowledge of the shrimp to assist the industry and the public in gaining an understanding of Florida's most important marine resource. The present issue has brought up to date information on this valuable industry. It describes and illustrates the different kinds of commercial shrimp and the spawning and development of shrimp. This report also gives information on where the shrimp are found; how they are caught; the value of the shrimp industry; the handling, shipping, and processing methods; and the use of shrimp as live bait. Regulation of the shrimp industry is also discussed.

#### UNITED NATIONS:

Fishery Programmes in Relation to Agricultural and Economic Planning, E/CN.11/DPWP.3/L.9

(Limited), 14 pp., printed. Economic Commission for Asia and the Far East, United Nations, New York, N.Y., September 19, 1957.

#### UNITED KINGDOM:

Report of the Fisheries Organization Society, Ltd., for the Year Ended 31st December 1956, illus., printed. Fisheries Organization Society, Ltd., Denison House, Vauxhall Bridge Rd., Westminster, London, S. W. 1, England. The present report contains an outline of the objectives of the Fisheries Organization Society and covers the work of the Society among the in-shore fishermen of England and Wales during the year 1956. It discusses the purpose of the Fishermen's Societies, how they are formed, and how they function. The report also outlines the operations of established Societies.

#### VIRGINIA:

The Bounty of the Chesapeake -- Fishing in Colonial Virginia, by James Wharton, 78 pp., illus., printed, 50 cents. Virginia 350th Anniversary Celebration Corporation, Williamsburg, Va., 1957.



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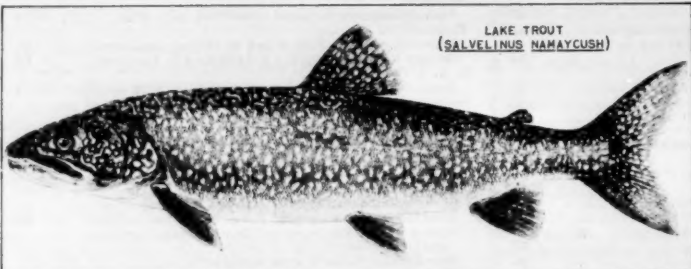
## CORRECTION

The number of the Fishery Leaflet, "Sea Scallop Boats and Gear," announced on the back cover of the December 1957 issue of Commercial Fisheries Review was No. 442.

## THE LAKE TROUT

Fishery Leaflet 441, *The Lake Trout (SALVELINUS NAMAYCUSH)*, describes the lake trout, geographic distribution, habitat, reproduction, the young, age and growth, food, movement, artificial propagation, and the Great Lakes fisheries for this fish species. Also discusses concisely the lake trout and the sea lamprey in the Great Lakes, and shows the commercial production in Lake Michigan, Lake Huron, and Lake Superior from 1910-1955.

The lake trout (also called mackinaw, togue, gray trout, Great Lakes trout, or namaycush) is a member of the salmon family (Salmonidae). Its body form, although variable, is usually moderately elongate



LAKE TROUT  
(*SALVELINUS NAMAYCUSH*)

and typical of the form shared by other trout and salmon. The scales are small, and the head, eyes, and mouth are large. The jaws, tongue, and roof of the mouth are strongly toothed. The conspicuous dorsal fin usually has 11 rays; a small fatty fin is located on the back near the tail. All fins are without spines; they are grayish, although the lower fins may show varying amounts of orange.

The body color of the lake trout varies from light to dark gray. Much of the body is mottled with light gray or whitish spots, and vermiform tracings cover the head and back. The species is distinguished from the brook trout, which it resembles more closely than other trouts, by its deeply forked tail, by the absence of brightly colored spots on the body, and by the absence of conspicuous light edgings on the lower fins.

The species' principal center of abundance formerly was in the upper Great Lakes (Superior, Michigan, and Huron), where for many years the annual commercial production averaged nearly 15 million pounds. It is now in danger of extinction in these waters, as a result of the invasion of the Great Lakes by the parasitic sea lamprey (*Petromyzon marinus*).

Lake trout are so widely dispersed in their environment that dense populations or high production in any given water are unusual. In inland waters the average annual catch by sport fishing seldom exceeds 1 pound per surface acre and the farflung commercial fishery of the upper Great Lakes has produced an average of less than  $\frac{1}{2}$  pound per acre per year.

The upper Great Lakes area was the major center for commercial production of lake trout for many years. Fish tugs were operated out of most port cities and towns lining the shores. Gill nets accounted for more than 70 percent of the production and set-hooks were next in importance; impounding nets, commercial trolling, and other methods combined yielded only about 5 percent of the total commercial catch. In the 10-year-period 1931-1940 (before the sea lamprey had decimated the stocks) the average annual production in the upper Great Lakes was 14.7 million pounds (worth more than 7 million dollars at present prices). Of this total, Lake Michigan produced 36 percent, Lake Huron 34 percent, and Lake Superior 30 percent. Forty-two percent of the total catch was landed in Michigan ports, 33 percent in Ontario, 19 in Wisconsin, 3 in Minnesota, 2 in Illinois, and 1 percent in Indiana.

The commercial production of lake trout in recent years has collapsed in Lakes Huron and Michigan and there has been a serious decline in Lake Superior since the invasion of these waters by the sea lamprey. In Lake Huron a production which exceeded 5 million pounds as recently as 1938 dwindled to less than 400,000 pounds by 1947 and to only 73,000 pounds in 1955. Lake Michigan's production of 5 million pounds in 1945 dropped even faster, to only 54,000 pounds in 1959 and 34 pounds in 1955. A downward trend in production in Lake Superior carried it to a low of 3.1 million pounds in 1955. The number of sea lampreys is increasing annually in Lake Superior, as is the frequency of lamprey scars on lake trout that are caught. Further, perhaps drastic, declines in production are expected.

Extensive research by federal, provincial, and state agencies of the United States and Canada has been directed toward the development of methods for control of the sea lamprey in the Great Lakes.



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